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REPORTS

ON THE

VIENNA UNIVERSAL EXHIBITION

OF

1873.

PART IV.

Presented to both Houses of Parliament by Command of Her Majesty.

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Mr. HENRY VIZETELLY.

WINES AND BEER.

REPORT on the WINES tasted at the VIENNA UNIVERSAL EXHIBITION of 1873, by HENRY VIZETELLY, ESQ.

The credit of the first attempt made to assemble together the wines of the world for the purpose of comparing and judging them is undoubtedly due to the French King, Philip Augustus, noted for his patronage of learning and his persecution of the Jews, a friend and enemy by turns of our own Cœur de Lion, and above all the grand consolidator of the regal authority in France, who sent forth his heralds, as the old chroniclers tell us, to summon, with due flourishings of trumpets, all the wines of the world to his royal and convivial table, that honour might be rendered them according to their deserts. If instead of a mere score or two of samples there had arrived in answer to this comprehensive appeal, the twenty thousand specimens of fermented drinks which came in response to the Emperor Franz Josef's invitation to the Vienna "Weltausstellung" of 1873, Philip Augustus and his bibacious chaplain, who sat in judgment on the wines in question, would have found their task equally wearisome and embarrassing. For the tasting, comparing, and judging, the Vienna samples taxed incessantly the palates, heads, and stomachs of some thirty jurors and experts, divided into four or more separate groups, for a period of nearly two months; whereas the French King and his gustatory adviser, hobnobbing at their ease over the Cyprus and the Malaga, experienced no kind of difficulty in conferring the fanciful dignities of pope, cardinal, king, count, and peer on the few wines they found most to their liking.

At no former Universal Exhibition were the same number of samples of wine exposed, as were brought together at Vienna. Generally speaking all the wine producing districts of the world were represented, and some idea may be formed of the vastness of their area when we explain that the northern limit of the zone, within which the vine is cultivated for the purpose of producing wine, commences at the Azores, passes south of England, and proceeding from Vannes in Brittany, beyond Mazières to Alençon in Normandy, mounts thence to Beauvais in the Isle of France, and subsequently striking still more northwards, through Rhenish Prussia, and above Dresden, ascends as high up as Königsberg, which forms as it were the apex. It then inclines southwards across the Carpathian mountains, traversing both Little and Eastern Russia to the upper shores of the Caspian, whence it stretches to the river Amoor, and the Pacific, intersecting North America just above San Francisco and Colorado, and skirting Lakes Michigan, Erie, and Ontario. The southern limits of the vine, which grows only at certain elevations and in particular localities within the tropics, after including Africa, Australia, and New Zealand, terminate in South America at Valdivia, in Chili, and Bahia Blanca, in the Argentine Republic. Although samples of wine came to Vienna from fully half the habitable globe, several of the grand *crûs* nevertheless made default, including far more than a moiety of the finer growths of the Gironde, together with all the more noted brands of Champagne, of which last-named wine the finest samples were exhibited by an English firm, James Anderson and Co., of London and Epernay.

Carefully considered and sufficiently judicious preliminary regulations were laid down by the jury to facilitate their proceedings, but from a variety of circumstances these had to be continually departed from. One broad rule, however, was invariably kept in view, not only were the individual intrinsic qualities of the different wines to be taken into account, but considerations of country and even of district were to have due weight. To have instituted anything approaching a comparison between the wines of different countries, and have decided on their relative merits, would have been impossible, and was of course not attempted.

THE WINES OF FRANCE AND ALGERIA.

I.—*Bordeaux Wines.*

At Vienna the wine jury commenced its labours with the wines of France, which has been termed not inappropriately the vineyard of the earth, its grand red wines for *finesse* and bouquet being unrivalled throughout the world, and its white wines led off by Chateau d'Yquem, at least equalling those of any other country, not omitting even the renowned Johannisberg, and the still more renowned Tokay, while as regard its sparkling wines, France is universally acknowledged to be without a peer. Unfortunately the arrangements of the French Commission were very imperfect, the wines being tasted in the open air with the thermometer at 85° in the shade, added to which, instead of having been previously stored in cool cellars like the majority of the samples intended for tasting, they had remained in many instances exposed to a tropical temperature, which as may be imagined had a serious effect on the condition of certain specimens, necessitating their absolute withdrawal from competition.

Seated around three or four small tables placed on the *perron* of the pavilion of the French Commission, and in the little garden square surrounding the latter, with a fierce sun shining over head, the jury entered upon its labours. It was a matter of regret that the grand red wines of the Gironde were represented merely by two of the four *premiers crûs,* four out of the sixteen *crûs* officially classed as second, and two of the thirteen *crûs* classed as third, the fourth and fifth *crûs* being altogether ignored. Not a single sample of Château Lafite, renowned alike for its magnificent colour, exquisite softness, delicate flavour, and fragrant bouquet, recalling the perfume of the almond and the violet with a marked predominance of the latter, was exhibited. Of late years this splendid wine is thought to have depreciated in quality, arising, if one may believe the gossip in the neighbourhood of the Château, through some former proprietor having "run out" the land. By dint of heavily manuring the largest possible yield is said to have been obtained, at the sacrifice, however, of those special mineral properties pertaining to the soil on which the excellence of the wine mainly depended. The second important absentee was Château Haut Brion, the one superb red *vin de Graves,* which, if scarcely so delicate and fragrant as its rivals of the Haut Médoc, is on a par with them, as regards its splendid colour besides possessing rather more body. Talleyrand was at one time the owner of this famous vineyard, the wines of which take equal rank with the three *premiers grands crûs* of the Médoc. Of Château Margaux, a wine which in good years has certainly no superior and scarcely an equal, the Vicomte Aguado exhibited a collection of fine samples; generous without potency, it refreshes the stomach while respecting the head, and boasts of a bouquet that clings to the lips and perfumes the breath. Of recent years the ancient reputation of this grand wine has been again and again challenged in print, arising from the fact of the Vicomte having signed a treaty with several large firms who engaged themselves to take for a specific number of years and at a fixed price of 4,000 francs the tonneau all the wine produced on the Château Margaux estate, a contract which undoubtedly seems to point to an increase of quantity to the possible disregard of quality.

The other grand Médoc wine, of which samples were sent to Vienna by its proprietor the Marquis de Flers, was Château Latour, deriving its name from an existing ancient massive round tower which the English assailed and defended by turns during the wars in Guienne,—a wine distinguished from Châteaux Margaux and Lafite by greater alcoholicity, a more pronounced flavour, and a more powerful bouquet which has been compared to the odour of almonds and noyau combined. The seductive bouquet common to all the grand wines of the Gironde, and which requires a certain age for its development, is understood to be due to an extremely fugitive volatile oil the elements of which are contained in the skins of the grapes. Particular conditions, met with only in certain soils, temperatures, and aspects, are requisite to the formation of this perfume, which rarely exists in wines of a generous character, either because the odour of the alcohol conceals it, or because the long fermentation necessary to decompose all the various principles causes it to completely disappear.

To such distinguished wines as Château Margaux and Château Latour, medals for progress—which the jury had formally determined should rank immediately after the diplomas of honour, and be but sparingly conferred—were naturally awarded. The same medal was also given to Baron Sarget de Lafontaine for his samples of Gruaud-Larose-Sarget, a wine, like all the higher class St. Julien growths, of deeper colour, and greater body and vinosity than the more delicate products of Latour and Lafite, and the bouquet of which closely resembles the raspberry. This wine ranks as one of the first of the St. Julien *crûs* and requires as these wines generally do, to be kept for several years in the wood, to develop all the qualities of a grand wine. MM. Erazzu and Dollfus likewise obtained medals for progress for samples of two famous St. Estèphe *crûs*; the one, Cos d'Estournel, where the grapes are invariably *foulé à pied* to the accompaniment of fifes and fiddles; the other Château Montrose, and both combining that agreeable flavour and extreme lightness, which distinguish the wines of this district, with a delicacy of perfume in a faint degree suggestive of noyau, and rivalling the bouquets of Margaux and Lafite. The finer St. Estèphe growths on attaining a certain age become highly tonical and suitable to elderly people and weak digestions. Other medals for progress were awarded to MM. G. Roy and A. Lalande for their Château d'Issan and Boyd-Cantenac, the former of a deep ruby tint, derived from the Tarney-Coulant species of grape, and both of them wines of considerable repute, grown in the commune of Cantenac and classed in the third category of Gironde *crûs*; also to M. Beaucourt for a wine of fine flavour and delicate perfume from the vineyard of Château La Bégorce, which ranks simply as a bourgeois *crû* in the highly favoured commune of Margaux, whose vineyards were in high repute so long as five centuries ago.

In addition to the two *premiers grands vins* of the Gironde, of which, as already mentioned, no samples was sent to Vienna, there were absent from the Exhibition wines of such celebrity as Branne-Mouton, next door neighbour to Château Lafite and noted for its nutty aroma, and which although classed in the second category is deserving, in the estimation of many connoisseurs, of being ranked among the *premiers crûs*, also a couple of other grand Pauillac wines, Pichon-Longueville, and Pichon-Longueville-Laland, with four wines of equal mark belonging to the commune of Margaux, and but slightly inferior to the famed Margaux itself. There were moreover five first class St. Julien wines absent, three of them being growths of the ancient vineyard of Leoville and distinguished for their bouquets resembling the odour of violets, while a fourth was the original Gruaud-Larose of which the *crû* of Gruaud-Larose-Sarget already spoken of forms an off-shoot. During the last century when the M. Gruaud, who has given his name to the vineyard, owned the property, it was his practice at the conclusion of each vintage to hoist above his château the flag of the particular nation which he thought his wine most likely to suit. Thus whenever it was thin and poor, and consequently cheap, he ran up the German colours; if full of flavour and body, and correspondingly dear, the British standard was unfurled; and on those occasions when it proved to be of an intermediate character, the Dutch flag floated over the square tower of the Château Gruaud.

With a single exception all the grand red wines of the Gironde are produced in the celebrated Médoc district, within the space of some 20 miles along a mere strip of undulating ground, narrow in size, but boundless in renown, bordering one of the principal rivers in France, namely the Garonne, and forming so to speak one vast vineyard cultivated as carefully as a garden. Above 45 degrees of north latitude, which includes the district in question, the culture of the vine becomes extremely difficult and uncertain, and there are particular provinces where in special seasons the vintage entirely fails. Indeed it is only by dint of incessant labour and care in the cultivation of the vine and in making the wine that successful results are to be secured. Strange to say the marked superiority of the Haut Médoc wines, which has rendered them famous throughout the civilised world is due more to the loose gravelly and flinty soil, and its ferruginous ingredients,—the presence of 9 per cent. of iron having been ascertained by analyses,—combined with the particular aspect of the slope (ordinarily N.E.), than to the species of grape, which is principally the Cabernet, the exceptional care bestowed upon its culture, or to any special climatic influences to which it is exposed. And it has been remarked that wherever wine of a superior quality is produced, the soil, no matter what its particular composition may be, is invariably found to be mixed with fragments of rock in a greater or less degree and of varied shapes and sizes. The rounded polished and light coloured pebbles with which the soil of the Médoc is strewn act it seems as so many reflecting agents, which directing the solar rays upwards concentrate the full power of the sun upon the grapes and bathe them as it were in a continual flood of light and heat. These pebbles, moreover, by reason of their peculiar composition have the quality of retaining the heat imparted to them long after the sun has sunk to rest, thereby rendering the evening coolness less sudden, and extending the time during which a favourable temperature prevails. Moreover in summer when rain is rare and the heat of the sun intense, the stones and pebbles on the surface of the ground assure to the soil a moisture and a coolness which are highly beneficial to the roots of the vines.

Of the dozen or so wines of the Gironde which obtained medals for merit at Vienna only a few need be particularized. The well known red *vin de Graves* of the vineyard of La Mission in the neighbourhood of Château Haut Brion, and which is chiefly remarkable for containing a larger proportion of natural alcohol than any other red wine of the district, had this medal awarded it, as had also M. Dussaut of St. Emilion, M. Pailhas of Libourne, and M. Bouffard of Bordeaux for their collections of the wines of St. Emilion, the generous character of which has secured for these growths the appellation of the Burgundies of the Gironde. In the eyes of many their deep ruby tint, body, and vinosity compensate for any deficiency in *finesse*, and delicacy of bouquet perceptible in them. Like all wines containing plenty of tannin and natural alcohol the St. Emilion growths require time to arrive at perfection and are scarcely at their best until they are 10 or 12 years old. Under very special conditions they may be kept for as many as 40 or 50 years, which no other *vin rouge* of the Gironde will bear without becoming sensibly deteriorated. Those who have tasted the famous Château Lafite of the great comet vintage of 1811, by far the grandest vintage within living memory, and which on the occasion of the sale at the Château in 1868 commanded the high price of 5*l.* the bottle, are forced to confess that they found the wine utterly worn out, and simply interesting as a curiosity. The same result was apparent in the grand wines of ancient vintages exhibited at Vienna by the Grand Duke of Nassau as I presently shall have occasion to point out.

Merman and Co. of Bordeaux secured a medal for merit for some St. Estèphe of remarkable *finesse* with an unusual amount of body and a delicate bouquet from the vineyard of Le Crock, one of the superior bourgeois *crûs* of the Haut Médoc. A like medal was also awarded to M. Deynaud for his samples of the unclassed wine of Château de Laforest near Pellegrue. Some few red Bordeaux wines met with honourable mention, including one or two *vins de côtes*—wines of the slopes—devoid of the earthy flavour common to these growths, and several *vins de palus*—wines of the marshes—notably those of Queyries which have the merit of developing a powerful perfume of violets as they grow old. Of those wines which secured no kind of recognition one may particularize a light Médoc wine, of splendid colour, and with a perceptible bouquet, but a trifle harsh to the taste, from the Château Malecasse, and a wine of considerable body with fine colour and a certain brisk flavour from the Salesse and Frechina vineyard near Blanquefort, both of them well known bourgeois *crûs* in the Haut Médoc.

Among the white wines of the Gironde which obtained the higher class reward two require to be especially mentioned. One the renowned Château d'Yquem of the Marquis de Lur Saluces, the most luscious and delicately aromatic of wines, which for its resplendent colour resembling liquid gold, its exquisite bouquet and rich delicious flavour, due, according to the chemists, to the presence of mannite, is regarded in France as unique, and which at Vienna naturally met with the recognition of a medal for progress. Mannite, the distinguished French chemist Berthelot informs us, has the peculiar quality of not becoming transformed into alcohol and carbonic acid during the process of fermentation. For a tonneau of this splendid wine 12 years old, bought direct from the Château, the Grand Duke Constantine paid some few years since 20,000 francs, or 800*l.* The other wine calling for notice was La Tour Blanche, one of those magnificent liqueur-like Sauternes, ranking immediately after Château d'Yquem, and to some fine samples of which, of the vintages of 1864 and 1865, a medal for merit was awarded.

The characteristic qualities of Château d'Yquem, which certain soi-disant connoisseurs pretend to pooh-pooh as a mere ordinary *vin de liqueur*, are due in no degree to simple accident. On the contrary the vintaging of this wine is an extremely complicated and delicate affair. In order to ensure the excessive softness and rich liqueur character, which are its distinguishing qualities, the grapes, naturally excessively sweet and juicy, are allowed to dry on their stalks, preserved, as it were, by the rays of the sun, until they become covered with a kind of down, which gives to them an almost mouldy appearance. During this period the fruit, under the influence of the sun, ferments within its own skin, thereby attaining the requisite degree of ripeness akin to rottenness. On the occasion of the vintage, as it is absolutely essential that the grapes should be gathered, not only when perfectly dry, but also warm, the cutters never commence work until the sun has attained a certain height, and invariably suspend their labours when rain threatens or mists begin to rise. At the first gathering they detach simply the *graines rôties*, or such grapes as have dried after arriving at proper maturity, rejecting those which have dried before thoroughly ripening, and from the former a wine of extreme softness and density termed *crême de tête* is produced. By the time the first gathering has terminated other grapes will have sufficiently ripened and rotted, or dried, and both sorts are now detached, yielding the wine called *vin-de-tête*, distinguished by equal softness with the *crême de tête*, but combined with a larger amount of alcohol, and greater delicacy of flavour. At this point a delay generally ensues, which is long or short, according to the state of the weather, it being requisite towards the end of October to wait while the rays of the sun, combined with the night dews, bring the remaining grapes to maturity, when the third gathering takes place, from which the wine termed *centre*, frequently very fine and spirituous, is produced. Another delay now ensues, and then commences the final gathering, when all the grapes remaining on the stalks are picked, which when the vintage has been properly conducted is usually only a very small quantity, and yield what is termed the *vin de queue*.

The grapes being dried and shrivelled considerable pressure is requisite to extract the juice from them, and at the Château d'Yquem this is accomplished by means of the ordinary wine press. The "must" is at once put into casks, where it is left to ferment for three weeks or a month, and even longer, according to the state of the temperature and the quality of the wine, during which period it throws off whatever impurities it contains; but only becomes perfectly limpid after being racked in from one to three months' time.

Altogether there were a considerable number of Sauternes exhibited at Vienna, including some of superior character, subtle, sapid, and delicate, generally sub-luscious, frequently over sweet, and occasionally dry and pleasantly acidulous, while scarcely any were undistinguished by a perceptible and fragrant bouquet. From the circumstance, however, of these wines being exhibited by *negociants* and not by the growers, they met with no distinct recognition at the hands of the jury. The samples of Barsac were less numerous, still many of them exhibited equal *finesse* with the higher class Sauternes, combined with greater body, perfect dryness, a more powerful perfume, and that generous warmth in which the last named wine is altogether deficient. The majority had that flinty flavour, the well-known *pierre à fusil* taste, so characteristic of the Barsac growths, and ascribed by the chemists to an excess of salts of iron, and by the vignerons of the district to the calcareous nature of the subsoil in which the vines are planted. It was evident that many of the French sweet white wines had been sulphured, so as to arrest their fermentation, and prevent the whole of their sugar from becoming converted into alcohol. Several jurors regarded the use of a considerable quantity of sulphuric acid as no disadvantage in itself, which very likely may be the case, provided, however, the fermentation has been completely suppressed by its application, and that the whole of the sulphuric acid has been subsequently removed by proper tapping.

A visit to the vineyards of the Gironde suffices to dissipate any fanciful notion one may have previously entertained respecting the so-called luxuriance of the vine growing at its own sweet will, and bending beneath its load of luscious fruit. On the contrary the vines, trained for the most part to low espaliers, rarely exceed four feet in height, and are kept as low as even a couple of feet in the Médoc to admit of the yoke of the oxen employed in ploughing up the ground between the rows, passing clean over them. The grapes, moreover, growing invariably in masses, and never in detached clusters, hang quite close to the ground, where the stem of the vine, as thick, perhaps, as one's wrist, is capable of supporting half a hundredweight or more without yielding. The species of vines principally cultivated in the Médoc, and from which the finest red wines in the world are produced, are the gros and petit Cabernet, the fruit of which is highly perfumed, and yields a soft, delicate, fragrant, and brilliant, though light-coloured, wine. A variety of the same species, termed indifferently the Cabernelle or Carmenère, much less fertile, but producing wine of considerable body and fine colour, is likewise cultivated in this district, together with the Cruchinet rouge, distinguished for the fine bouquet which it imparts to the wine. The two first named are also the dominant vines in the Graves of Bordeaux, so called from the pebbly character of the soil, where they are known as the grosse and petite Verdure. In the vineyards of the Côtes the prevailing species is the Malbec, which produces a wine deeper in colour and almost equally soft and delicate, but difficult to keep; while in the vineyards of the Palus it is the Verdot variety to which preference is given. This grape yields a sound, pleasant, rich coloured wine with a bouquet resembling the violet, a wine which requires age to develop all its better qualities, and repays any care bestowed on it by keeping for many years.

Commonly five other varieties of grape enter more or less into the composition of the wines of the Médoc, one the Merlet, the distinguishing characteristics of which are lightness, delicacy, and softness; another the Mancin, an abundant bearer; next the Tarney-Coulant and the Teinturier, both of which, and more particularly the latter, impart depth of colour; and lastly the Sirrha, the grape of the Hermitage vineyards, and which gives to the wine both body and firmness.

The fine white wines of the Gironde are produced from the Sauvignon and Semillon grapes, the former of which yields a limpid, perfumed, delicate-flavoured, amber-coloured, heady wine, while the latter gives a sweet, agreeable flavoured wine, partaking largely of the character of a liqueur, and deepening considerably in colour with age. They are more or less mixed with other varieties, notably the Rochalin, believed to be of the Sauvignon species; the Muscadelle, having a certain affinity, as its name implies, with the well-known Muscat grape; the Blanc doux, the berries of which are sweet and highly transparent; the Pruéras, almost equally sweet in character; the Blanc Auba; and the Blanquette, a variety of the famous table grape, the Chasselas which, in Europe at any rate, rarely produces good wine.

The favourite grape cultivated in the upper plains of the Gironde is the Enrageat, belonging to the same species as the Folle Blanche, or crazy vine, which prevails so extensively in the Deux-Charentes, and from the fruit of which *fine champagne* cognac is distilled.

In the department of the Gironde 145,121 hectaires equivalent to 358,614 English acres, being one eighth of the entire cultivated surface, are planted with vines. In 1870, the vintage of which year gave more than an average yield, these produced 74,811,610 gallons of wine, whereas last year, when the vintage was a most indifferent one, they produced merely a little more than a third of this quantity, or 27,322,559 gallons, valued in official documents at 3,540,460*l.* A very rigid classification, influencing the prices which their wines command, exists of the superior vineyards, the red wines being divided into five separate categories, while the white, forming merely 9 per cent. of the wine production of the Gironde, are classed into three, of which Château d'Yquem ranks as the unique *premier crû.* The classed wines form only 2 per cent. of the total production, the superior table wines being equivalent to 12 per cent., the medium to 20 per cent., and the *vins ordinaires* to the remaining 66 per cent.

Since the year 1840 the vintages of the grand red wines of the Gironde have been of the following character. Very good: 1841, '44, '46, '47, '48, '51, '58, '64, '65, '68, '70. Good: 1857, '62, '63. Bad and indifferent: 1840, '42, '43, '45, '49, '50, '52, '53, '54, '55, '56, '59, '60, '61, '66. The white wines may be thus classed:—Good: 1840, '41, '46, '47, '51, '52, '54, '58, '59, '61, '64, '69. Bad: 1842, '43, '45, '50, '53, '56, '60. The alcoholic strength of the wines of the *premiers grands crûs* ranges from 13½° to 17° of proof spirit, Château Lafite being the least spirituous of all, Château Margeaux coming next, Château Haut Brion ranking third, the most alcoholic being Château Latour, which is about two degrees stronger than Lafite, and on this account is known locally as the *vin d'Hercule.* Wines lower in the scale are more spirituous than those occupying the highest rank, the St. Emilion growths showing at times even as much as 20° of proof spirit. The difference between the white wines is very great, the more alcoholic occasionally indicating as many as 26°, and the least spirituous as few as 12°.

The latest Bordeaux quotations of Gironde wines give the following as the prices: The *premiers crûs* of 1869 vintage 6,300 francs, of 1870, 8,000 francs the tonneau (containing nearly 1,200 bottles). The second *crûs,* among which the wine of Branne-Mouton commands an exceptionably high price, range from 4,000 to 5,000 francs, the third, fourth, and fifth descending gradually in price until the last-named reach 2,400 francs per tonneau for 1869 wine, and 1,300 francs for 1872 wine. Just in the same gradual way do the prices of the *bourgeois* and *paysans crûs* decrease until we come to the wines of the *paysans des paroisses ordinaires* which are quoted as low as 700 francs. The foregoing applies exclusively to the Haut Médoc. Of the Graves the one *premier crû* corresponds with the prices already given, the second *crûs* together with the first Saint Emillion *crûs* ranging from 1,000 to 2,800 francs, and the lowest priced wines of all being the *artisans* and *paysans* growths of the Palùs, quoted at from 500 to 650 francs. The quotations of wines in bottle give the grand wines, such as Châteaux Lafite and Margaux, at 6 and 7 francs the bottle for vintage 1862: 12 to 15 francs, 1864, and 9 and 10 francs, 1868; the second *crûs*, such as Leoville, Gruaud-Larose, Cos d'Estournel, Montrose, &c., ranging from 15 to 50 per cent. below these figures. The quality of the vintage, it should be understood, has far more to do with the price than mere age, and there have even been instances when the grand wines, which ordinarily command 6,000 francs and upwards, have been sold off, as was the case in the year 1860, at merely 1,000 francs the tonneau.

With regard to the white wines Château d'Yquem for 1865 commands 7,000 francs the tonneau; the best Sauternes and Barsac *crûs* ranging as high as 5,000 francs for 1869, and as low as 1,000 francs for 1872 vintages. From these prices the scale descends gradually until it ends at the *petites Graves* and the *vins blancs* of Entre-deux-Mers, which are quoted respectively at from 400 to 600 francs, and 350 to 525 francs the tonneau.

The total value of the exports of wine from the Gironde during the year 1872 was 5,662,000*l.*, 28 per cent. of which, consisting almost entirely of red wines, and valued at 1,670,400*l.* was shipped to British ports. During the same year Great Britain consumed 3,257,130 gallons of French red wine, and 1,514,272 gallons of white, equivalent to upwards of 35 per cent. of the total consumption.

II.—*Burgundy, Mâcon, and Beaujolais Wines.*

The deep purple, full-bodied, velvetty wines of the Côte d'Or carried off at Vienna half a dozen medals of progress, four of which were secured by the descendants of Monge, the famous mathematician, a native of the district, and who, as Louis XVI.'s Minister of War and Marine, signed the order for that monarch's execution, and after narrowly escaping the guillotine himself, shared in the honours and emoluments of the first empire. The Monge family among them exhibited a varied and extensive collection of the grand wines of Burgundy, many of which were in fine condition. Their own vineyards are managed very much in their ancestor's way, that is mathematically; order reigns everywhere, everything has its place, the people employed work with the regularity of machines, and all manner of mechanical appliances are in use to economise manual labour.

The generous vinous growths of Burgundy have always been in high renown, and centuries ago wines and vines alike of this favoured province passed as presents from one royal personage to another, just as grand *cordons* are exchanged now-a-days. Burgundy was then the wine of nobles and churchmen, one of the latter of whom chants—

"Nous les boirons lentement,
Nous les boirons tendrement,
Ton Clos Vougeot! ton Romanée!"

The vignerons of the Côte d'Or, or golden slope, for the purpose of classifying their products divide the district into the Côte de Nuits and the Côte de Beaune, the former of which boasts what the Burgundians technically term their best *climats*, the most esteemed being at Vosne, whence come Romanée-Conti, La Tâche, and Richebourg, with Romanée-St. Vivant, La Grande Rue, Gaudichot, Malconsort, and several others. Of these Romanée Conti is recognised king.

The characteristics of this splendid wine are body combined with extreme *finesse*, velvetty softness, rich ruby colour, and delicate bouquet. Genuine Romanée is rarely to be met with, for a prolific vintage never exceeds 4,000 bottles. The name may figure in thousands of prices current and *cartes de vin*, but at the best you can only expect to obtain Romanée-St. Vivant, or some other member of the extensive family of Romanée; good enough wines in their way, but occupying merely second or third rank among the Burgundy *climats*. La Tâche and Richebourg are equally fine wines with Romanée-Conti, and the former has the extra merit of being what the French term *corsé*, meaning a stout wine all the component parts of which are intimately mingled. Moreover, a wine of this character forms a deposit without becoming thin. Ordinarily, even moderate age wears out the best Burgundies, as was shown by several of the samples, and one found a Richebourg of 1869 far superior to the more ancient vintages.

Clos de Vougeot is usually classed after Richebourg, although connoisseurs generally are disposed to give the palm to Chambertin, which is a finer kind of Volnay, and the *vin velouté* par excellence of the Côte d'Or. It was this latter quality which made it a favourite with Napoleon I.

To considerable body it unites a fine flavour, and a suave bouquet with great *finesse,* and has, moreover, the much prized merit of not becoming thin with age, as the majority of the Burgundy growths do. It was for some fine samples of this wine that Madame Marey-Monge had a medal for progress awarded to her. The Clos de Bèze on the northern side of the Chambertin vineyard produces a wine of a more piquant character, less soft and delicate, still one which, while impressing the taste, suggests neither the smallest sense of acidity, nor any excess of vinosity. Clos de Vougeot can certainly lay claim to a more decided and characteristic bouquet than Chambertin can boast of. It is likewise a firm wine, less refined in flavour, it is true, than Romanée and the other grand Vosne *crûs,* with a suggestion, too, of bitterness such as exists in the Médoc growths when young, and which is due to their tannin. On this account it requires to rest four years in wood. The mention of Clos de Vougeot naturally recalls the well-known story of its enthusiastic military admirer, who, while marching his regiment to the Rhine commanded his men to halt before the vineyard and present arms in its honour. At Vienna the merits of Clos de Vougeot were recognised less ostentatiously; the wine was found excellent, and a medal was awarded to it.

One of the most delicate wines of the Côte de Nuits is Musigny, and the sample, which secured to Count Vogué a medal for progress, if in some degree deficient in that velvetty softness distinguishing the grander *crûs,* possessed considerable *finesse* and roundness, combined too with a fuller flavour, which the wine has the advantage of retaining when old. Among the more spirituous growths distinguished by remarkable body and flavour, but deficient alike in refinement and bouquet, preëminence must be given to St. Georges, a highly generous, robust, and even harsh wine, which tones down advantageously with age without losing substance, and some excellent samples of which had been sent to Vienna. The adjoining vineyard of Les Cailles, yielding a wine far more delicate in character, was equally well represented. Among commoner growths one may mention those of Morey, and especially the Clos de Laroche, which furnishes a remarkable wine; also the Clos de Tart and Bonnes-Mares, yielding sound, strong, and full-flavoured wines, devoid alike of bouquet and *finesse.* Some samples from Prémeaux exhibited more of these latter qualities, while others from the *crû* of the Marcs d'Or, near Dijon, while possessing a certain delicacy were entirely deficient of perfume. The wines from the Clos de Crébillon, near

Brochon, attracted attention, simply as coming from the place whence two once famous writers of the last century—Crébillon, the lugubrious, who composed sombre tragedies, and his son, Crébillon, the gay, who indited licentious novels—filched their family name.

The wines of the Côte de Beaune secured merely three medals at Vienna against 11 awarded to the vintages of the Côte de Nuits. Two circumstances contributed to this result, the smaller number of samples from the former district and the damaging influence of the temperature on certain of those which had been forwarded.

The grand wines of Volnay, firm and delicate, with a distinctive and refreshing flavour slightly suggestive of the raspberry, and a seductive bouquet unrivalled by any other growth of the Côte d'Or, were well represented. One sample from Les Petits Caillerets was exquisitely round; another from the Clos du Chêne was firm, and perhaps a trifle harsh; while a third from Les Bouches d'Or was vinous, delicate, and velvetty, but all exhibited that refined flavour which distinguishes the genuine wines of Volnay. From the neighbouring vineyard of Santenay at Meursalt came a red wine which in fine years is ranked by connoisseurs above Corton as uniting all the richness of the *grands crûs* of the Côte de Nuits with the *finesse* characterising Volnay. It has the merit, moreover, of retaining its richness and remaining firm with age.

From Aloxe came some samples with that fine, full, and even grand flavour which distinguishes the Corton wines, combined with more bouquet than is met with in any other *crû* of the Côte de Beaune, Volnay alone excepted. Corton takes equal rank with Volnay, and is not unfrequently classed above it, owing no doubt to its greater richness and its quality of outliving less robust rivals. When at 10 years of age these are becoming dry and withered, Corton will still preserve all the qualities of a grand wine.

The samples from Beaune, for certain of which M. Arnoux obtained a medal, included a variety of firm, intimately blended wines, with a clear pure flavour, the finest being the produce of the Fèves vineyard. The Clos des Mouches furnishes a somewhat delicate and mellow wine, the Cras one of a stouter growth, and the Grèves a wine remarkable for body combined with *finesse.* Of the Pommards some were singularly round, but inclined to be dull and heavy, while others combined robustness with an almost vivacious flavour; and others again, from the Clos de Citeaux, were agreeably delicate and mellow. Santenay, a wine possessing roundness and body, with the drawback of an occasional *goût de terroir*, was unrepresented at Vienna, but there were some soft delicate Chassagne wines resembling certain inferior Volnay growths, together with a sample of Savigny, having very much the character of a fine Corton, and for which M. Lefèvre secured a medal for merit.

Chassagne, whose red wines are not especially remarkable, enjoys, with Puligny, the honour of producing the finest white wine of the Côte d'Or,—at once its Château d'Yquem, Johannisberg, and Tokay,—the renowned Montrachet which every native-born Burgundian maintains to be the grandest white wine in the world. The distinguishing characteristics of Montrachet are *finesse*, fulness, absolute homogenity, and softness, combined with a powerful yet delicate flavour and immense richness. It has, moreover, a most characteristic and eminently suave bouquet very distinctly developed, and will keep, as is said of all the grand white wines, almost any length of time without losing a single one of its splendid qualities. This is the Montrachet *ainé*, the veritable wine from a vineyard half way up the slope of the hill whence it takes its name; two other and less commendable varieties known as the Chevalier and the Bâtard, being severally vintaged, the one at its summit and the other at its base, of which the former has great and even delicate flavour, while the latter, although with a taste slightly resembling the real Montrachet, is heavy, harsh, and altogether wanting in *finesse*. Genuine Montrachet commands a fabulous price, and even the Bâtard in good condition sells at from 60*s*. to 70*s*. the dozen, retail.

MM. Serre and Co., of Meursault, and Forest and Co., of Beaune, were the principal exhibitors of white Burgundies for which the latter firm carried off a medal. The best samples of Meursault came from the vineyard of Les Charmes, and were fine, firm, soft wines with a fragrant vivacious flavour. Those from Les Perrieres and Les Combettes are full, dry, and delicate, the first-named, however, with a faint taste of sulphur. Others from Les Gouttes d'Or, perfect, as their name would imply, as regards colour, are full and mellow, but deficient in *finesse;* while others again from Les Genevrières are rich, velvety, and liqueur like. Age commonly renders these wines thin and weak, but when well preserved, they develop a fragrant vinous dryness.

Chablis is not a product of the Cote d'Or, but of the department of the Yonne, which sent to Vienna most of its white wines, under that well-known name. Thin, pale, dry, and delicate, and with the distinguishing *pierre à fusil* taste which is their recognised characteristic, the genuine wines, affected by the high temperature had merely honourable mention accorded to them. Among other wines from the Chablis district was a red variety named Clos Thorey of the vintage of 1857, which, thanks to time, had developed some commendable qualities, with a *vin rouge mousseux* of Epinail quite on a par with the best sparkling red wines of the Côte d'Or.

There were a fair number of exhibitors from Mâcon, and among them the wines of the surrounding districts were satisfactorily represented. The finest samples were those exposed by MM. Piot frères and Ferret, to both of whom medals were awarded. The Mâconnais and Beaujolais growths of any repute, red and white varieties included, may be easily counted on one's fingers. There are a couple of tolerably good red Mâcon wines, and a single distinguished white one, with less than half a dozen Beaujolais, light and agreeable wines enough, but occupying inferior rank. And even the two red Mâcon wines of repute require very special conditions to merit even an approach to the character of fine wines. Possessing no high vinous qualities, they are ordinarily at their best as early as their third or fourth year, still there was a perfectly sound Moulin-à-Vent of the vintage of 1865 exhibited, light and delicate alike in flavour and bouquet, and for which M. Ferret received his medal. Of Thorins there were several samples with considerable character about them, and others possessing the drawback of unmistakeable harshness. The inferior red growths from the vineyards of Prissé, St. Amour, and Creusenoir offered nothing requiring comment. The better specimens of Pouilly, the one really good white wine of the Mâconnais, were more satisfactory. They were distinguished by a certain *finesse*, were dry and spirituous, with a slight nutty flavour and fine bouquet. Of other white Mâcon wines those of Fuissé, Solutré, and Chaintré lack *finesse* and generosity, although the first-named is not entirely without character.

The vineyards of Mont Brouilly, Chesnas, Juliénas, St. Etienne, Fleurie, and Morgon on the southern slopes of the Beaujolais hills,—the last named taking its name from the little river which flows close by—all sent samples of their produce, the best the district yields, to Vienna. The majority had a delicate bouquet, were fresh and light in body without being at all thin, as well as soft and pleasing to the palate, although most of them had that slight medicinal flavour, due in all probability to some peculiarity of soil, which characterises these wines. All without exception were remarkable for their rich sparkling colour, scarcely excelled by any wine in the world.

The species of vines most cultivated in Burgundy are the Pineau noir and the Gamay, the former of which produces wine of high quality, deep in colour, and spirituous, while the latter, which is the most prolific bearer and the prevailing grape throughout the Mâconnais and the Beaujolais, yields wine paler in colour as well as somewhat acidulous. All the white wines are produced mainly from the Pineau blanc.

The aspect of the grand Burgundy vineyards is principally south-east, and the soil which is calcareous is impregnated with iron. Indeed, ironstone exists in a greater or less degree in all the more celebrated vineyards of France, including the Médoc, the Côte d'Or, the Champagne, the Hermitage, Rousillon, &c. Carbonate of lime is also prevalent in many of them, still its presence is by no means inseparably associated with the growth of all the higher class wines, for scarcely any trace of it is to be found in the vineyards of the Médoc, the Hermitage, or Côte Rôtie. French œnologists deduce from this that oxide of iron is essential to the productions of fine wine, and they are further of opinion that wines grown on an ironstone soil possess keeping qualities, to which those from a limestone soil can lay no claim, although the prevalence of lime is believed to be largely conducive to alcoholic strength.

A practice prevails throughout Burgundy of plastering the common wines during the process of vinication, as a precaution against aceteous fermentation, and in the course of the anxious nursing which the grand wines undergo they are frequently sulphured as well as fortified with a moderate quantity of spirit, more especially when sugar has been added as it sometimes is to the *must.*

Since the year 1840 the grand Burgundy vintages number less than half a score, and include merely the following years, 1842, '46, '49, '54, '57, '65, '68. The natural strength of the finer Burgundy growths ranges from 19 to 22 per cent. of proof spirit, although in exceptional years they have shown as much as 24, and as little as from 13 to 15 per cent., while wines vintaged from the Gamay species of grape frequently contain even less than 10° of proof spirit. The fine white wines ordinarily contain from 20 to 30°, the Mâconnais and Beaujolais growths averaging from 18 to 20 per cent. of proof spirit.

The wholesale prices on the spot of the grand wines of the Côte d'Or range from 400 to upwards of 1,000 francs the pièce of 50 gallons (300 bottles), or from 3 to 8 francs the bottle according to vintage and age. Inferior growths are quoted from 200 francs upwards, and *vins ordinaires* as low as from 100 to 150 francs the pièce. The finer wines of the Mâconnais command from 200 to 400 francs, and those of the Beaujolais from 150 to 250 francs the pièce of 47 gallons; young *vins ordinaires* ranging from 90 francs upwards.

III.—*Wines of the Côtes du Rhône.*

It was principally the higher class wines of the Côtes du Rhône, such as Hermitage, Côte Rôtie, Condrieu, and St. Peray which made their appearance at Vienna. Of undoubted Hermitage there were only a couple of exhibitors, one of whom carried off a medal. The samples were commendable, still not to be compared to the Hermitage one has tasted in the growers' cellars at Tain, including the exceptional vintage of 1808 belonging to the Marquis de Florens, one of those unquestionably grand wines which for 63 years had gone on improving in quality and perfume and more than all had retained much of its original richness of colour. The Hermitage which secured the Vienna medal had the recognised bouquet recalling the raspberry, a remarkably clean, fresh, full, vinous flavour combined with great firmness and softness, and was, moreover, of the indispensable rich deep purple hue. The white Hermitage of a pale yellow tint and with an ambrosial perfume that may be pronounced unique was exquisitely suave, rich and spirituous in flavour, and perfectly dry. Of the vinous, luscious, almost unctuous Hermitage *paille* with its volume, its marrowy richness, its delicious smoothness, combined with an indescribable refreshing sharpness free from the slightest acidity, not a solitary sample was exhibited.

Some Côte Rôtie of the years 1867 to 1870 exhibited by M. Paret failed to show this peculiar wine at its best. In the first place only the 1868 vintage was at all remarkable, and in the next the wine was too young. Côte Rôtie, which is due to the mixture of the Terine noir with the white Vionnier grape, when of a really good vintage, requires keeping from three to four years in the wood and as many as ten years in bottle, if it is desired to develop its recognised higher qualities. Its purple hue will by this time probably have become a rich maroon, still there will be a bright limpidity about the wine combined with considerable *verve*, a faint tonical bitterness and a fruity fragrant perfume resembling a compound of raspberries and violets. Côte Rôtie is not a wine to sip by itself, but to drink with rich dishes, or better still, juicy viands which bring out all its peculiar and fascinating flavour. A theory, I believe, prevails that Côte Rôtie affects the nerves, but they laugh it to scorn at Ampuis, where those who have the chance drink the wine, of which the little village is so proud, all their lives.

Of the few samples of the white wines of Condrieu some with a rich dry nutty flavour were remarkably pale and almost as spirituous as a cordial, while others were deep amber coloured and more luscious in character. Of the rose colour wines of the Côtes du Rhône, such as the dry and insiduous Tavel, the firm and generous Lirac, and the robust Roquemaure, with the luscious Chusclan and St. Geniès, and the pleasant light sparkling Laudau, the majority made default, the district being more or less overrun by the Phylloxera vastatrix. Some good growths of the Côtes were, however, exhibited by MM. Tête and Barthélemy, who were accorded medals for merit. Honourable mention was also made of the dry St. Peray exposed by M. Boode—a wine extolled by Alexandre Dumas in his "Impressions de Voyage"—for its briskness and pleasant spirituous flavour. Of the once famous wine Châteauneuf-du-Pape, intensely deep in colour, of great volume, and with a peculiar sweet bitterish taste, and which was once the daily beverage of the Avignon popes—not a single sample was exhibited. In former years Châteauneuf-du-Pape used to produce annually its 12,000 hogsheads of wine, instead of the hundred or two it does at present. The wine indeed appears to have gone completely out of fashion, condemned either by its licorice-like flavour or by its headiness, and to-day the produce from the few vineyards which the Phylloxera has not utterly ravaged is principally consigned to the Côte d'Or to impart some of its superfluous body and colour to the poorer Burgundy growths.

The alcoholic strength of the Hermitage wines varies between 21 and 25 per cent. of proof spirit, the Côte Rôtie wines being about the same, while white St. Peray will frequently indicate as many as 27° Hermitage ranges in price from 400 to 700 francs the pièce of 46 gallons, the straw wine commanding 6 to 8 francs the bottle. Côte Rôtie is priced at from 300 to 450 francs, Condrieu at 200 francs, and dry St. Peray at from 200 to 300 francs the pièce. These prices are all on the spot.

IV.—*Wines of the South of France.*

Vienna was deluged with the cheap, and in many instances coarse and characterless, and highly alcoholic products of the departments of the Hérault, the Gard, the Aude, and the Pyrenées-Orientales, the majority of the samples being of the 1872 vintage, and scarcely one in a hundred having arrived at a moderate age, although the growers of these southern wines claim for some of them the merit of keeping for at least half a century. This was, however, possibly of no very great moment, as age, however much it might improve, could scarcely develop any high character in them. Their one unquestionable merit was extreme lowness of price, some of the samples being in ordinary years as low as 13 francs the hectolitre of 22 gallons. They were no doubt well adapted to the purpose for which they are largely employed, that is, mixing with the pale, feeble, and acidulous wines of the centre of France. With respect to the specimens from the Hérault, the agricultural society of Montpelier had the higher class medal awarded to it for samples of St. Georges, the single wine, with the exception of its *vins de liqueur*, of any particular character produced in the department, being of a lively colour, highly spirituous, and boasting a faint bouquet; medals for merit given to MM. Vidal and Gemeys for red and white wines respectively, and to MM. Richard and Sabatier for their collection generally of wines of the Hérault. Among the red wines next to St. Georges came St. Chrystol and St. Drézery with Aramons *légers*, *mi-couleur*, and *de choix*; the white wines including Clairettes *sèches* and *douces*, Bourrets *blancs*, and Piquepouls-Bourrets. The Muscats were numerous, and there was one sample of Tokay grown in the Hérault which secured the approval of those who knew the wine at its best in the Hegyalja, its natural home. Some Vin Rancio exposed by Count Cassagnac received honourable mention, which was likewise accorded to a dry spirituous Picardin wine from the Château of Canet near Clermont, the produce of the Clairette grape (a variety of the Malvoisie) and which had a decided Madeira character about it, also to a sweet wine from Valros, near Pézenas, the latter the so-called garden of the Hérault, and noted as the place where Molière wrote "Les Précieuses Ridicules," and engaged in his first dramatic enterprize. In addition to these various recognitions honourable mention was made of 23 other exhibitors of wines from this department.

The samples from the Gard were the most numerous of all, scarcely one of its known and unknown wines being unrepresented. In addition to those already enumerated among the growths of the Côtes du Rhône, there were the bright purple, full-bodied, spirituous and robust St. Gilles with its unmistakeable *goût de terroir*, the more delicate Langlade, the powerful Florac, the locally admired Costières, Uchard, Jonquières, and Vauvert, with Lédenon from the vineyards in the neighbourhood of Nimes. For some excellent samples of the last-named wine a medal for progress was given to M. Thurney.

In consideration of the completeness of the collection of the wines of the Gard and of the great progress made of recent years in viticulture and vinification throughout the department, the one diploma of honour given for French wines was conferred on the Agricultural Society of the Gard. In addition the single medal, of which mention has been made, was awarded, but no less than 20 exhibitors secured honourable mention for their wines, in the list of which those of St. Gilles occur again and again.

The wines from the Aude were deep in colour, full in flavour, highly spirituous, and generally speaking perfectly new. Spite, however, of this drawback, there was a kind of softness about the majority of the samples, and with regard to the others the French experts sought to reconcile us to their unpleasant rawness by explaining that in about 16 years' time they would be positively delicious. The Limoux wines were found to be of a more delicate character.

The old province of Languedoc was originally planted with vines from Spain at a period when it was under the same crown with Arragon, and it is principally Spanish varieties which are still cultivated there as well as in other southern departments. Hence the marked similarity which exists between certain red wines of the south of France and those of Spain.

The Pyrenées-Orientales sent samples of its Rivesaltes and its Roussillon, its Opoul, Salces, Monnai, and Estargel, its Vins Rancio and its Muscats. Good Roussillon is deep in colour, sound, fruity, spirituous, full-bodied as a Burgundy, and has moreover the merit of a bouquet. Altogether it would be an excellent ordinary wine were it not invariably fortified with extraneous spirit to enable it to travel while young. One of the best growths matured by moderate age is still, I believe, imported to England under the name of Masdeu, but only if it bears the "Durand" brand can it be relied on. Considerable quantities of Roussillon, mellowed by artificial heat, and dosed to excess with raw spirit, according to the process I have witnessed in operation at Cette, are palmed off in England and elsewhere as "vintage port."

The red wine of Rivesaltes is of the Roussillon type, as are Opoul, Salces, &c., except that the last-named are somewhat inferior varieties.

The Muscat wines of the Hérault and the Pyrenées-Orientales were almost as varied in flavour as they were in colour. Those from Lunel were luscious, delicate, and spirituous, and had the approved muscadine aroma; those from Rivesaltes were even sweeter and altogether more unctuous and powerful both in flavour and perfume, while those from Frontignan had more *finesse* and less vinosity, and were smoother, mellower, and more fragrantly aromatic, confirming the impressions I had previously formed of these wines at their seat of production. For samples of Frontignan exposed by MM. Chevet and Co., of Paris, this well-known firm received a medal for merit, the same reward being accorded to M. Bellard for his Muscat of Lunel.

The Rancio wines made from the black Grenache grape and fermented after a peculiar fashion turn tawny in the course of their second or third year and become lighter with age, just as the Muscat wines grow darker, until they attain the colour of the topaz, when they are regarded by their producers as perfect. In flavour they resemble a sweet, spirituous Port. The prevailing grapes from which the dry red Roussillon wines are made are the Grenache which gives sweetness, the Carignan which imparts colour, and the Mataro which yields quantity. Judging from their names these vines, like most of those of Languedoc, would appear to be of Spanish origin.

The wines of the Hérault, the Gard, and the Aude, which are invariably sold quite new, can ordinarily be bought soon after the vintage from as low as 15 francs up to as high as 40 francs the hectolitre of 22 gallons for red wines, and as high as 65 francs for the sweet white varieties. The Roussillon wines command from 35 to 50 francs the hectolitre, and the superior Muscats as much as from 150 to 400 francs according to quality and age.

There were two exhibitors of wine from Corsica and three from Nice, but only the samples of the dry white wines of Capo Corso, the sweet red wines of Sartena, and some Santa Lucia Rancois with a fine bouquet, contributed by M. Pingliesi of Ajaccio were considered deserving of recognition. There are 24,000 acres under cultivation with the vine in Corsica, which are estimated to yield annually about six and a half millions of gallons of wine.

V.—*Champagnes and other Sparkling Wines.*

Among the 13 exhibitors from the Champagne, exposing exclusively sparkling wines—not a single sample of rare red Bouzy or fresh and delicate still Sillery made its appearance at Vienna—none of the leading Champagne firms were represented. Content with renown more or less merited neither *the* Cliquot, nor *the* Rœderer; neither Mumms, Moet, Marceaux, Pommery, Perrier-Jouet, Piper, Deutz and Geldermann, Giesler, Heidseck, Ruinart, nor Roussillon, honoured the Exhibition with their presence. There were, however, plenty of samples of wines which, if enjoying less repute, were still of the very first character, it being well known that some of the finest wine is produced by Rheims and Epernay firms of whose existence even the ordinary connoisseur is ignorant; the jury therefore had no hesitation in according awards to Dosse and Co., Minet *jeune*, and Fenwick and Co. of Rheims, and Anderson and Co. of Epernay, Dufaut and Co. of Pierry, and Bumiller of Avize, for the samples they exhibited. All were remarkable for delicacy and bouquet, and for that more or less refined flavour inherent only in the genuine products of the vineyards of the Champagne; but especial recognition is due to the samples of the rare vintages of 1857 and 1865, exhibited by James Anderson and Co. of Epernay. The 1857 wine was of the very highest character, otherwise in the course of 16 years its constitution would certainly have become impaired, whereas it was exactly the reverse. Rather deep in colour and with a full perfume and rich ambrosial flavour, undisguised by that fussy frothiness common to the inferior qualities, it was evident in a moment that the wine was the result not merely of an exceptional year but of fully ripened grapes from one of the first vineyards in the Champagne. The newer wine had a dry delicate flavour, with a little less richness, and was lighter both in colour and body. Their bouquet was exquisite. It is strange that in no other corner of the globe can a sparkling wine of the same high character be produced as is obtained from the poor and chalky soil of the Champagne, where it is essential to plant the vines as close as possible together that the natural warmth which they communicate to each other may force as it were the ripening of the fruit.

The wines of Roper frères of Epernay, exhibited through their London agents J. R. Parkington and Co. of Crutched Friars, met with recognition from the jury on the score of quality combined with extreme cheapness, for in addition to being unquestionably genuine they were of agreeable flavour and possessed both delicacy and bouquet. After standing the test of an almost tropical temperature for upwards of a month these wines were found not to have suffered in the slightest degree, proving, what is a rare quality with cheap Champagnes, their complete capability of resisting the trying influences of a hot climate.

With the exorbitant prices commanded by the leading Champagne brands, which, owing to increased consumption, contain every year less and less of the Champagne grape, attention may be advantageously directed to the sparkling wines produced in the other districts of France and offered at about one-half the rate of high class Champagnes. Foremost among these must be instanced St. Peray, a purer wine than Champagne itself, as its natural saccharine is in such excess that it does not require dosing with sugar and spirit like all Champagnes from the finest to the commonest. Some remarkably good sparkling wines came from Lons-le-Saunier in the Jura, while inferior qualities came from Saumur, St. Cher, and Bar-le-duc; Barsac on the Drôme sending some sparkling rose Muscat, with the perfume of the rose very distinctly developed. The French sparkling wines, however, which furnish perhaps the best substitutes for Champagne are those from Vouvray in the neighbourhood of Tours, notably the mitre brand of Dupanloup and Co., which possesses the requisite lightness and exhilarating qualities of a *vin mousseux* combined with pleasant flavour, besides being what cheap sparkling wines very frequently are not, namely, the genuine juice of the grape.

A medal was awarded to M. Vielhomme for some sparkling red Burgundy, and singular to say to M. Soucard for what he termed "Champagne of High Life," a compound of wine and brandy—the latter predominating—in a state of effervescence. Stranger than all, medals for progress and merit were given to MM. Blouquier fils and Wachter respectively for their imitation wines, a well-known house in Cette, the hot bed of this nefarious industry, being simply rewarded by honourable mention for its efforts in the same objectionable direction.

The subjoined tabular statement constructed from documents, issued by the French Minister of Finance, shows the vineyard area of France, with its average production, together with the quantity and value of the wine vintaged last year. The total yield being small, the estimated prices are exceptionally high. The first six departments are those which produce the finest growths, namely the Gironde, producing

VINEYARD AREA AND PRODUCTION AND VALUE OF THE VINTAGE IN FRANCE.

Departments.	Vineyard area in acres.	Produce per acre in 1873 in gallons.	Average annual produce during the last 10 years in gallons.	Total Produce in in 1873, in gallons.	Value of the Vintage, 1873, in pounds sterling.		Total Value, 1873.
					Fine Wines.	Vins Ordinaires.	
					£	£	£
Gironde - - - - - -	358,614	76·18	64,304,829	27,322,559	2,308,958	1,231,502	3,540,460
Côte d'Or - - - - -	81,295	99·7	16,684,658	8,107,305	279,946	530,412	810,358
Marne - - - - - -	40,185	78·14	8,735,593	8,140,097	1,062,340	60,277	1,122,617
Drôme - - - - - -	88,642	42·4	6,713,873	3,763,548	22,944	306,432	329,376
Rhône - - - - - -	96,802	81·8	20,562,546	7,926,561	183,215	613,614	796,829
Saône-et-Loire - - - -	107,329	73·6	24,322,884	7,907,611	112,120	543,416	655,536
Hérault - - - - - -	541,071	547·3	230,243,224	296,132,885	720,000	18,620,539	19,340,539
Charente Inférieure - - -	384,173	104·59	118,871,333	40,180,453	—	2,922,929	2,922,929
Charente - - - - - -	273,787	50·5	77,050,345	18,849,693	—	1,132,659	1,132,659
Gard - - - - - -	204,741	152·4	42,318,957	31,215,233	—	1,924,095	1,924,095
Aude - - - - - -	167,239	387·5	42,159,519	64,814,026	3,600	4,492,227	4,495,827
Gers - - - - - -	220,122	81·9	32,671,371	18,041,963	—	1,194,363	1,194,363
Pyrenées-Orientales - - -	138,678	195·5	15,084,722	27,112,133	246,366	1,773,838	2,020,204
Sixty-two other departments, Corsica not being included.	3,180,985	74·2	476,352,845	236,574,854	237,115	19,243,162	19,480,277
Total - - -	5,883,658	—	1,176,076,199	786,088,916	5,176,604	54,589,465	59,766,069

the Bordeaux wines; the Côte d'Or, the Burgundies; the Marne, the Champagnes; the Drôme, the Hemitage; the Rhône, the Côte Rôtie and the Beaujolais; and the Saône et Loire, the Mâcon wines. It will be noticed that last year's vintage in the above departments was sometimes as little as a third, and rarely more than half of an average one. With regard to the Marne, which comes within the first of these categories, even if every gallon of wine that it produced last year, were converted into Champagne—and it is well known that a considerable portion is not adapted to this purpose—the total quantity would still be insufficient by four millions of bottles to meet the demands of the annual consumption, which for the year 1872–3 attained the high figure of 22,381,888 bottles, or double what it was ten years ago.

In the seven remaining departments, which are those ordinarily producing the largest quantity of wine, the contrast is scarcely so striking, the yield from three of these being largely in excess of an average one. The principal deficiency is in the brandy producing district of the Deux Charentes, both of which departments show an immense falling off, one indeed yielding only a little more than a sixth of what it ordinarily does. The remarks made with reference to Champagne will therefore be equally pertinent with regard to Cognac.

In certain localities the falling off in last year's vintage is due entirely to that new scourge of the vine in Europe, the Phylloxera vastatrix, supposed to have been originally imported into France in 1823 with certain specimens of the *vitis cordifolia* of the United States for the Jardin des Plantes, but which only manifested itself in the French vineyards some eight or nine years ago at Pujault on the right bank of the Rhône and in the department of the Gard, whence it spread to Roquemaure and Villeneuve-les-Avignon in Vaucluse, appearing in the course of 1866 in the vineyards of the plain of La Crau in the Bouches du Rhône, when M. Delorme, of Arles, called the attention of the scientific world to its ravages. By 1867 all the vineyards of Vaucluse, together with several of those of the Gard, were more or less attacked by this insect, and in the following year the scourge, spreading along the banks of the Bas-Rhône, eventually made its appearance in the department of the Drôme. In 1869 it spread westerly in the direction of Nimes, and easterly in that of Aix, showing itself, moreover, in the vicinity of Toulon and at Lunel-Viel, since which time it has attacked the vineyards around Montpellier, and extended its ravages to the Dordogne, as well as travelled along the banks of the Rhône to Lyons, and manifested itself in the departments of the Isère and the Basses-Alpes. Last year it appeared in the Charente, and no doubt its ravages influenced the falling off in the produce of that department. With regard to the Gironde an isolated case originally showed itself in 1868 in the vineyard of M. Laliman at Floirac, a few miles from Bordeaux, and since then the scourge has spread through other communes of the Entre-deux-mers. It has not, however, as yet touched the Médoc, although great fears are entertained for the future of the renowned *crûs* of that district. The vineyards bordering the Rhône have suffered most severely, those of Châteauneuf-du-Pape being almost destroyed, while the Condrieu, Côte Rôtie, and Hermitage vineyards are already assailed.

In 1871 the Minister of Agriculture offered a prize of 20,000 francs, which the Bordeaux Chamber of Commerce petitioned to have increased to a million, for the discovery of a means of ridding France of the scourge. Small as the prize is in comparison with the vast interests at stake, it has, nevertheless, sufficed to quicken the zeal alike of savans and empirics who have come forward with a legion of nostrums more or less inefficacious. Insecticide powders innumerable have been brought into requisition; manure mingled with plaster, lime, sulphur, salt, soot, and tar has successively been tried; experiments have been made with carbolic, arsenic, and sulphuric acids, with sulphuret of carbon, creosote, ammonia, and petroleum; the roots of the vines, moreover, have been swaddled in green tobacco leaves, and in some localities even an attempt has been made to eradicate the pest with fire. The chymical agents occasionally revived ailing plants, but failed to annihilate the Phylloxera. Out of 140 proposed panaceas which the Agricultural Society of Montpellier thought it worth while to put to the test, 34 produced some slight beneficial results, and nine injured or killed the vines, the remainder exercising no influence whatever for good or evil. Sulphuret of potash was the substance that had the most favourable effect; still the submersion of the vines under water is the only remedy that has hitherto been tried with great success. At a recent session of the Société des Agriculteurs de France, an engineer, M. Aristide Dumon, proposed to draw off a quantity of water from the Rhône in the neighbourhood of Condrieu, and by means of a canal to inundate from 20,000 to 25,000 acres of vineyards situated along the Côtes du Rhône. Several deputies brought the subject before the National Assembly, but the proposal was rejected by the Budget Committee from want of funds to dig the canal in question. Last autumn M. Planchon, a well-known French naturalist, visited the United States and ascertained that certain species of American vines are left untouched by the Phylloxera, and that their ravages among the others are reduced to a mere bagatelle, thanks to the activity of a parasitic insect termed "a cannibal," which feeds upon the Phylloxera with remarkable voracity. M. Planchon, delighted with his discovery, brought back with him a large number of these so called cannibals, but at present it is not known whether he has succeeded in multiplying them as he proposed, and meanwhile the Phylloxera continues its ravages unchecked.

A full vintage in France, such as that of the year 1869, yields its 70 millions of hectolitres of wine, or one-third more than the vintage of last year, the increased value of which would be an extra four millions sterling, besides nearly two millions and a quarter additional for the *eau-de-vie* distilled from the husks and stalks of the pressed grapes. The after value of these as food for cattle and as manure, combined with the value of the pruned branches of the vine, both as fodder and fuel, will, according to the estimate of Dr. Guyot, adopted by M. Drouyn de Lhuys, a former Minister of Agriculture and Commerce, bring up the total value of a full vintage to 76,178,310*l.* sterling. Although the vineyard area comprises less than a twentieth part of the soil of France, the yield amounts in value to almost a quarter of the total agricultural revenue, and furnishes the means of existence to one-fifth of the entire population. The total exports of wine from France during 1870 amounted to 66,456,970 gallons, valued at 8,673,040*l.*

VI.—*Wines of Algeria.*

The wines from Algeria, which comprised 73 red and 55 white varieties, had suffered considerably from their exposure to the high temperature of the Vienna Industrial Palace. Although highly spirituous they are singularly deficient in robustness, and were consequently among the first to be affected. The high temperature during the autumn season, and above all the droughts which prevail when the grapes are ripening, interfere materially with the quality of the wine. The largest number of specimens came from Milianah and Barkadem, but, excepting the straw wines of the Agricultural Society of Crescia, none were of a high character. Two red wines exposed by MM. Gilles and Merlé-Senia secured medals, and no less than 24 samples, of which the majority were red wines resembling the inferior growth of the Hérault, received honourable mention.

In 1866 the area of vine cultivation in the province of Algiers was 12,580 acres, and in that of Oran 8,842 acres, the total amount of wine produced being about a million and three-quarters of gallons. Since that period the production has risen to about 2¼ millions of gallons, one-sixth of which are *vins de liqueur* said to be of excellent quality.

The contributions from the vineyards of France and her colonies to the Vienna Exhibition may be thus summarised. Only 20 out of her 76 wine producing departments were represented by 278 exposants, two-thirds of whom were from the Hérault, the Gard, the Aude, and the Pyrenées-Orientales. They contributed altogether 920 samples, and had awarded to them one Diploma of Honour, 21 medals for progress, 38 medals for merit, and 83 diplomas of recognition, equivalent to honourable mention. The exhibitors from Algeria, who forwarded 128 samples, obtained two medals for merit, and 24 diplomas of recognition.

THE WINES OF GERMANY.

I.—*Rhine Wines.*

The wines from the Rhine comprised as large a number of historical examples as all the other wine growing districts combined. From the vaulted refectory of the old Bernardine Abbey of Eberbach, now the cellars in which the grand Steinberger wine is stored, came samples of all the cabinet treasures of the Grand Duke of Nassau, including not only the famous vintages of the present century, but several of the past, and together thirty-one in number. There was for instance one archaic Hochheimer no less than a hundred and sixty-seven years old, that is to say, of the vintage of 1706. Fancy drinking a wine of the year when Marlborough gained the battle of Ramillies, and which it is not unlikely the founder of the reigning dynasty in these islands drunk more than one bottle of on his journeys backwards and forwards, between Great Britain and Hanover. Other Hochheimers followed coeval with the war of American Independence, and then came a comparatively juvenescent wine of the same renowned *crû* which was fermenting in the vat while the battle of Jena was being fought, with a Steinberger of the year preceding the disastrous retreat of the French from Moscow.

The truth however must be told, and unfortunately the wines recalling these remarkable historical reminiscences proved to be completely worn out. Indeed the majority of those anterior to the year 1846 were but phantoms of their former selves, having lost not only their fine high flavour, but all their vinous attributes, including that fragrant aroma for which the higher class Rhine wines are so justly celebrated, and retaining in fact nothing of their ancient splendour save their brilliant colour. Hochheimers and Marcobrunners were *in extremis*, and even the noble Steinberger of the famous comet vintage of 1811 had succumbed, besides which so few as one and thirty years had sufficed to utterly vanquish even the fiery Rüdesheimer, as was proved by the sample of the year 1842. It should be remembered, however, that not one of these wines had had a drain of extraneous alcohol imparted to it since the hour of its birth. To fortify a grand Rhine wine would be in the eyes of the humblest "winzer" of the Rheingau a sin which nothing could atone for. The marked difference observable in the wine of 1846, and every bottle of subsequent years, exhibiting as it did more or less high character, body, and *finesse*, seemed only to be accounted for by some great improvement having taken place not alone in the process of vinification pursued, but also in the culture of the vine itself in the great vineyards of the Rheingau. The foregoing wines it should be observed were all tasted under the most advantageous circumstances in an apartment of some government building in the vast and antique cellars of which the samples had been stored together with those of the wines of Austria, Hungary, Italy, Russia, Greece, Turkey, and Roumania.

The crown of the Grand Ducal collection was unquestionably the Steinberger cabinet of 1862, a most superb wine which for bouquet, refined high flavour, combined richness and delicacy, and sub-acidulous freshness was considered by several of the jurors to be unrivalled by any white wine in the exhibition. The other examples of Steinberger, comprising all the grand vintages, were every one of them remarkable wines, and fully sustained the world-wide renown of this famous *crû*. It is simply within the last fifty years that the practice has prevailed of employing only over-ripe grapes in the production of Steinberger, after the fashion which has been in vogue for nearly a century past, with regard to Schloss Johannisberger. The so-called "cabinet" Steinberger is made exclusively from carefully selected grapes, none but the finest berries being chosen, and the gathering never taking place until after the autumnal morning dew has been completely dispersed. The juice is expressed from the grapes by men treading them, not with naked feet, as is the practice in many parts of Europe, but wearing long heavy soled boots, specially provided for the purpose.

A Marcobrunner, also of 1862 vintage, and a Rüdesheimer berg of the year preceding, proved inferior merely to the superb Steinberger cabinet. All the wines, in fact, of the Grand Ducal collection from the year 1846 to 1868, comprising the majority of the finest growths of the Rheingau, were of the highest character, and sustained, it must be admitted, the reputation which German connoisseurs persistently claim for them.

Although some Schloss Johannisberger was included among the samples sent by the Grand Duke of Nassau, this aristocratic and somewhat overrated wine was far more completely represented by the small collection exhibited by Prince Metternich, the owner of the world-renowned vineyard, and embracing the best vintages between the years 1857 and 1868, every bottle being sealed and every cork duly branded with the Prince's crest. The excessive sweetness of the majority of these wines, much admired as they were, masked in a great measure their distinctive character. Johannisberger, at its best, that is when its excess of sugar has become converted into alcohol, is a rich limpid, magnificent amber-colour wine, forming beads round the glass, tasting singularly fresh in the mouth, deliciously soft, yet with a pronounced and almost pungent flavour, and possessed of a bouquet of remarkable fragrance and strength. Several of the Prince's wines, however, were of that excessively luscious character as to have been easily mistaken for the finer growths of Frontignan and Lunel. The 1862 vintage proved to be the more delicate wine, 1859 the higher flavoured, while that of 1861 was the more luscious. These wines were quoted at the uniform price of 35*s.* the bottle, and the inferior vintages at the rate of 24*s.* At the very time the jury were tasting these wines the last remaining cask of the 1861 vintage, containing 1,500 bottles, was sold from the cellars of Schloss Johannisberg to Consul Bauer, of Moscow, at the rate of 33*s.* 4*d.* per bottle. These extravagant prices are the result rather of the factitious reputation which Schloss Johannisberger enjoys than of the special qualities which the wine undeniably possesses. As a matter of course both the Grand Duke and the Prince had medals for progress assigned them for their unique collections.

Among other wine growers of the Rheingau who sent the best productions of their vineyards to Vienna one may instance Baron Cunibert, who forwarded samples of Oestricher auslese, made, as he was careful to inform us, from the most perfect and ripest grapes, grown, moreover, in the very best situations. It is this which constitutes the peculiarity of these so called *auslese* wines, the grapes for which are invariably left to attain the stage known as "*Edelfaide*," in other words "noble rottenness," when the selection is made with so much care that they are even picked singly off the bunches, should this be considered necessary. The baron's wines were remarkable for their seductive softness and exquisite richness. The price quoted for the 1862 and 1863 vintages was 870*l.* the tun of 240 gallons, or rather beyond 12*s.* per bottle. A medal for merit was awarded for these wines as well as for the samples exhibited by Herr König of some superb Rauenthaler berg auslese of the vintages of 1862, 1865, and 1868, the first named with the full fragrant bouquet for which this wine is celebrated, and the latter known as the "non plus ultra." Herr Lade sent some splendid Geisenheimer Rothenberg of 1859, 1861, and 1862, from vineyards in close proximity to Johannisberg and priced at from 600*l.* to upwards of 850*l.* per tun, but which his position on the jury rendered *hors concours;* while Herr Müller of Eltville contributed an excellent sample of Rauenthalerberg auslese (1865), valued at 560*l.* per tun, a fine Eltviller Sonnenberg (1868), a Rüdesheimer berg Riesling (1862), estimated somewhat more moderately, and a Hallgarten auslese (1868) of superior character. A medal for progress was given for these admirable wines. Count von Fürstenberg Stammheim forwarded an interesting collection of Kiedricher Gräfenberg ranging from the comet year of 1811 down to 1861, and a few samples of Gräfenberger auslese of more recent vintages, while Burgomaster Crass sent Erbacher auslese of the year 1868 valued at 600*l.* per tun and rewarded by a medal for merit.

Some Erbacher Marcobrunner and admirable Nonnenberger, both estimated at rather more than two-thirds of this figure, were exhibited by Baron Rossum of Erbach and Herr Herber of Eltville. Hochheimer of recent years was represented by some fine *auslese* wines, and we had Marcobrunner of 1868 at no more than 400*l.* the tun from the cellars of Burgomaster Hofmann. Of Winkler, a wine grown in the immediate neighbourhood of the Johannisberg, there were four exhibitors exposing several varieties, such as Duchsberg, Hasensprung, &c., among which an 1868 vintage sent by Herr G. Müller obtained a medal for merit.

Herr Willelmj of Wiesbaden forwarded no less than 50 *auslesen* of different vintages ranging from 1857 to 1868, and comprising Hochheimer, Hattenheimer, Geisenheimer, and Rauenthaler, with some remarkably choice Trockenbeer auslese vintaged from several of the best vineyards of the

Upper Rhine, but which although in its twelfth year had not yet perfectly cleared itself. Only one or two samples of 1868 wine were included as the finer varieties were not in sufficient condition to support a journey without considerable risk. Nearly all the earlier years had been rewarded with first prizes at the Paris Exhibition of 1867, and on the present occasion the Vienna jury assigned them a medal for progress. The racy flavour one looks for in Rhenish wines was not entirely lacking, although, as with several of the *auslesen* already spoken of, these samples exhibited a surprising softness combined with a richness that could scarcely be excelled. Unfortunately, however, these exceptional qualities are produced at the cost of the natural development of the wine, the fermentation of which being checked by the addition of sulphur in order to retain the saccharine element, much of the flavour and raciness properly belonging to the best growths of the Rhine, as well as their fragrant bouquet, are sacrificed. Real connoisseurs are of opinion that it is a grand mistake to encourage the growing taste for these luscious products in which the sacchariferous element predominates to the detriment of the finer vinous qualities. The preservation for any length of time of over rich wines of this description, notwithstanding the skilful manipulation by means of which the fermentation is checked, is at the best a very doubtful matter. Wines of this character, moreover, can only be partaken of but sparingly, besides which such little as is drunk serves to cloy rather than to refresh the palate. Their expensive character is easily accounted for when it is considered that the entire growth of a vineyard suffers more or less by the system pursued of picking out all the finest and over-ripe grapes. It was stated that the prices of these wines ranged from 15*s.* to 45*s.* per bottle, the latter amount being about 30 per cent. beyond that demanded for Schloss Johannisberger.

The firm of Dilthey Sahl & Co. secured a medal for merit for their remarkable collection of Rüdesheimer of various growths and vintages ranging from the medium qualities to the very finest, and which were quoted from as low as 3*s.* to as high as 30*s.* per bottle. A "cabinet" wine of the year 1859 proved remarkably delicate with the merest suggestion of a faint bitter flavour which gave it moreover a certain distinction, while a Rüdesheimer Rottland of a splendid golden colour and of great lusciousness had all that exquisite subdued sharpness which distinguishes the finer *auslesen*, combined with a slight flinty taste evidently derived from the soil where it was grown. The finest

Rüdesheimer berg comes from the vineyards bordering the Rhine, and which extending in steep terraces half-way up the mountain allow of the grapes basking in the summer sun. The Rottland vineyards have the same aspect, and their terraced stone walls when viewed from the river convey the impression of a Cyclopean staircase. Some very fair wine came to Vienna from the slopes of the Rochusberg immediately opposite Rüdesheim. Readers of Goethe will remember the open air sermon he heard here, and in the course of which the preacher glorified God in proportion to the number of bottles of good wine he was daily able to stow inside his waistband. Herr Rosenstein of Wiesbaden was rewarded with a medal for merit for ten picked samples of Rauenthaler, a wine grown at the southern extremity of the Rheingau, the 1865 vintage of which secured the gold medal at the Paris Exhibition. The finer qualities of these wines were priced at 25s. the bottle.

Tourists will readily recall to mind that portion of the Rhine, a few miles above Bingen, at which latter place it will be remembered on descending the river the gorge of the Rhine is entered. It is within this limited territory some 10 miles long by about four broad that all the famous wines of which we have been speaking are produced, with the single exception of Hochheimer, which, although it comes from vineyards on the banks of the Main, several miles above its confluence with the Rhine, has supplied us with a generic name under which we indiscriminately and improperly class the entire productions of the Rhine vineyards. What is called the Rheingau comprises the district both above and below Bingen, between the Walluf and the Wisper brooks, and it is on the low hills along the right bank of the river between Rüdesheim and Eltville that all the best vineyards are to be found. At Schierstein a little higher up a tolerably good wine is grown, much of which is employed in the fabrication of *vins mousseux*.

On the opposite bank some fair red wines of a Burgundy character are produced in the vineyards of Heidesheim and Ingelheim, and samples of the last named of the vintages of 1865 and 1868 exhibited more softness and *finesse* than is ordinarily met with in the red wines of the Rhine, which are exposed to great disadvantages arising from the low temperature at which they are fermented. The bend which the river assumes at the Rheingau is said to have the effect of concentrating the sun's rays reflected from the surface of the water as from a mirror upon the vine clad slopes, and it is to this circumstance combined with the favourable nature of the soil and to the vineyards being completely sheltered from the north winds by the Taunus range that the marked superiority of the wines of the Rheingau is ordinarily attributed. The grape most extensively cultivated and supposed to be indigenous to the district is the Riesling which imparts to the Rhine wines their marvellous bouquet. The other varieties principally grown are the pink colour Traminer, the Elbling, for a long time believed to be identical with the Pedro Jimenez of the Jeres district until the error was exposed by Count Odart, the distinguished French ampelographist, the green Orleans, and the Pineau noir or large black Burgundy. The soil consists of different kinds of clay schist intermingled with quartz, and largely impregnated with iron and occasionally covered with layers of clay, loam, or gravel. The vines are heavily manured, the principal vineyard proprietors keeping a considerable number of cows solely for this purpose. The annual produce of the entire Rheingau averages 1,100,000 gallons.

Within the gorge of the Rhine itself the only wine of particular repute produced is Assmannshauser made from the Pineau noir above mentioned and the one good red wine of the Rhine district. There was no lack of samples of the so called Burgundy of the Rhine, but none were considered entitled to a medal. Close by Assmannshauser are the Bodenthaler vineyards yielding with those of Lorch, some little distance beyond, third class wines—the latter with a decided *goût de terroir*—of which samples of the 1868 vintage were tasted at Vienna, and had honourable mention made of them. Still lower down the stream is Bacharach famous in the middle ages for its wine, held in high favour by the Popes, but which retains none of its ancient repute at the present day:

"The old rhyme keeps running in my brain;
At Bacharach on the Rhine,
At Hochheim on the Main,
And at Würzburg on the Stein,
Grow the three best kinds of wine."

As late even as the 17th century Bacharach wine was much esteemed in England, Howell in his letters mentioning that the cunning Hollander had a trick of putting some infusion into a poor wine of Rochelle to give it a whiter tincture and more sweetness, so that he might pass it off in England as good Bacharach. It has been however suggested that it was rather to Bacharach being the port of shipment for Rhine wines generally than to any particular merit in the wines of the district that the Bacharach *crû* became so renowned.

From the vineyards in the rear of Ehrenbreitstein came samples of Kreutzberger, a rather agreeable red wine, and from those of the valley of the Ahr which falls into the Rhine near Sinzig midway between Coblenz and Bonn came several dark red wines such as Walporzheimer, Ahrbleichert, Ahrweilerer, and Bodendorfer fine enough in colour, but all more remarkable for their astringent flavour than for any refined vinous quality, while from Linz on the opposite bank a capital specimen was sent of a red wine called Dattenberger, thought worthy of a medal for merit.

Of the wines produced on the left bank of the Rhine, above Mayence, some favourable specimens of Nachenheimer, including one of particularly marked character, were exposed by Herr Kraetzer, who received a medal for progress, while for a collection of Bodenheimer of various vintages, exhibited by Herr Dolles, a medal for merit was awarded. Of the well-known Liebfrauenmilch, a Riesling wine with a tolerable bouquet, from the vineyards adjoining the Liebfrauen Kirche, near Worms, and which owes its reputation rather to the singularity of its name than to any inherent qualities of its own, the best samples were sent by Herr Valkenberg, who had a medal for merit allotted to him. Honourable mention was made of an excellent Guntersblumer auslese Riesling exhibited by Herr Hartmann. There was neither Niersteiner nor Laubenheimer calling for remark, but a fine Herrenberger Riesling of 1870 exposed by Dr. Forster, had the honour of being classed in the first rank; a medal for merit being given to Herr Stephan for a Hesslocher of refined flavour of the year before.

There are no purer nor better made white wines in the world than the finer growths of the Rhine, which, excepting in the case of the sweet *auslesen*, are always perfectly fermented, but unfortunately their higher qualities are entirely dependent on the perfect ripening of the grapes, which, as may be supposed in so northern a latitude, is a matter of considerable uncertainty. During the last 20 years there have been seven good, nine bad, and four medium vintages of Rhine wines. The good years included 1857, '58, '59, '61, '62, '65, and '68; whereas the bad comprised 1856, '60, '63, '64, '66, '67, '69, '71, '72. As when the vintage is good the wine growers have to recoup themselves their losses in bad years, when the wine, exceedingly acid, fetches a mere per-centage of its ordinary price, and as, moreover, Rhine wines require several years to mature themselves, during which interval they are the object of unceasing attention, it naturally follows that the normal price of the best Rhenish growths rules high, far higher indeed in proportion than the *premiers crûs* of the Médoc command. Again, mere rarity alone in the case of the superior growths causes these to attain a fantastic figure. A half butt of Steinberger of the vintage of 1846 has realised as much as 5,820 florins by auction, or at the rate of nearly 500*l.* the 750 bottles for its first wholesale price.

With regard to the inferior growths it has been the fashion of late years to more than repair any deficiency, of which nature may have been the cause, by aid of the well known process of Dr. Gall for quintupling the produce of a vintage. A Cologne newspaper was the first to call attention to the circumstance, in the following terms:—

"In the district of Neuwied things have come to a sorry pass indeed. The evil has been imported by wine dealers from abroad, who come in numbers every autumn, and, whether the vintage promises well or ill, buy up the growing grapes, and make from them five or six times the quantity of wine which the press of an honest vintner would produce. The reader will ask, how is that possible? Here is the explanation.

"During the vintage, at night, when the moon has gone down, boats glide over the Rhine freighted with a soapy substance manufactured from potatoes, and called by its owners sugar. This stuff is thrown into the vats containing the *must*, water is introduced from pumps and wells, or, in case of need, from Father Rhine himself. When the brewage has fermented sufficiently, it is strained and laid away. The lees are similarly treated three, four or five times over. When the dregs are so exhausted that further natural fermentation has become impossible, chemical ferments and artificial heat are applied. This cooking, or stewing, is continued often until midwinter, producing wines of every description for the consumption of every class. The noble fluid is sent away by land and water to its places of destination; and the dealers are seen no more until the next vintage season. Their business lies in the most distant parts to which the beverage can be carried, where, of course, there is no end to their praises of its purity, its sources, and of the rustic simplicity of its producers.

"The example thus set by strangers has been only too closely followed at home. The nuisance is largely on the increase, and the honest vintner is the greatest sufferer. He rarely succeeds in selling his entire vintage at once, partly because the quantity of grapes required by these manufacturers is constantly diminishing, and partly because the practices described have driven away desirable purchasers from the localities. The 'Gallization' of wine benefits none but the professional adulterators, and the poorest class of small growers, who are indebted to it for a sure market for their small and inferior crops. Some grapes are still required for the fabrication of wine, although an infinitely small quantity is sufficient."

In face of all these facts a tourist with no more experience of Rhine wines than that gained from German hotels, where, with occasional exceptions, the qualities are ordinarily of the lowest, and where even the labels on the bottles rarely indicate the real name of the wine he is drinking, may make up his mind that he knows nothing whatever of the finer vinous growths of the renowned Rheingau.

II.—*Moselle and other German Wines.*

The wines of the Moselle exhibited at Vienna though " innocent " enough, according to the popular German definition of them, were certainly superior to the pale, thin, feeble, and more or less acidulous growths that figure on the *karten* of German hotels under the head of "Mosel-wein." Instead of common *tisch-wein* of the Rhine and the Palatinate labelled Brauneberger and Pisporter, we had the wines themselves, and in their best condition. All of them, of course, were young, for they lack the robustness of their brethren of the Rhine, and in no single instance had an attempt been made to prolong their vitality with adventitious alcohol. If they wanted character and softness and all the higher vinous qualities which result from age, and their bouquet was oftener artificial than natural, they were at any rate light and delicate, and possessed a fresh and at times even a decided flavour, rendering them highly palatable.

There were several collections more or less complete of these wines forwarded from Trêves, and in one or the other were to be found samples of all the good varieties, including the red wines produced principally along the lower Moselle, and one or two of which were excellent, besides the more noted growths of the Saar valley. Thus we had the well-known Pisporter, Grünhauser, and Brauneberger at their best, for which Herr Richter obtained a medal; next Graach, Zeltinger, and the Berncastle wine, known locally as "the doctor," all three of such excellent quality as to secure a couple of medals to their exhibitors; also the products of the vineyards of Unsberg, Aalfang, Muhlrecherberg, Münchenroth, and Landfurberg in the neighbourhood of Trabach and Traben which carried off three medals between them. For the wines of the lower Moselle the best of which are produced at Winningen another medal was given, and Herr Mohr of Trêves, for the general excellence of his collection, had a medal for progress awarded him; medals of the same class were given to Count Kesselstadt for several samples of Pisporter and an especially racy Josefshofer, and to Herr Baulwitz for a remarkably fine Scharzhofberger, the two last-named from the Saar valley, and, with Wiltingener and Ober Emmeler, the only growths of mark which it produces. For samples of the Saar wines generally Herr Görtz of Saarburg obtained a medal.

The wine growers of the Nahe valley contributed some common table specimens of their products including a brisk Itzsteiner, with a decided though by no means unpleasant flinty taste, some excellent Schlossberger, and several varieties of their justly prized Scharlachberger, a wine usually produced from the Orleans grape, but the best sample of which was from the Riesling variety and was very highly commended for its great character and delicacy. This wine even when purchased in cask commanded as much as between four and five shillings the bottle. In addition to the foregoing there were half a score of Nahe wines the names of which are rarely heard outside the district, such as Kausenberger, Norheimer, Monzingener, Eberuburger, Bosenheimer, &c., wines without delicacy and with an unmistakable flavour of the flinty soil whence they come, but all of them fresh tasting. Merely a single medal for merit was given for still Nahe wines, and that to Herr Soherr of Bingen.

The species of grape cultivated in the Moselle vineyards, the steep slopes of which have all a more or less southern aspect, are merely three, the Elbling, the Riesling and the Pineau noir, the latter, as already observed, the prevailing grape in the vineyards of Burgundy and the one from which the red wine of the lower Moselle is exclusively made.

The vintage growths of the Bavarian Palatinate, where the closed and open low training of the vine is a kind of tradition, were favourably represented at Vienna by some very fine "auslesen"—Deidesheimers and Forsters—distinguished, spite of their almost too luscious character, by remarkable fullness of flavour and fragrance of perfume. The exhibitor of these samples, ten in number, and nearly every one of them with a distinctive character of its own, was Herr Jordan of Deidesheim. The most syrupy of all was the Deidesheimer Kirchenstück of 1859, a gorgeous golden coloured wine of such excessive richness that to sip it was sufficient. Considering its age and the prices demanded for Rhine auslesen, which this wine certainly equalled, the latter could scarcely be considered dear at the sum demanded, namely, 150*l.* the hogshead, equivalent to 10*s.* the bottle. The same wine of 1862 was equally soft and seductive, with the advantage of lacking the excessive richness of the elder type. A Deidesheimer Grán of 1868 proved singularly fine and delicate, and a Deidesheimer Kieselberg of 1870 although a little sweet was distinguished by its fresh delicious flavour. Most of these wines assimilated in a measure to the finest Haut Sauternes, still they possessed very distinct qualities of their own. Moreover with one or two exceptions they were hardly to be classed as mere *vins de liqueur.* One specimen in particular, a Forster auslese of the year 1865, was a remarkably delicate dry wine with a tender tonical flavour that was especially captivating. A medal for progress was given without hesitation to the exhibitor of these wines, which are entitled to rank with the finest Rhine growths, more particularly when we learn that their superior quality is mainly due to excessive care and labour on the part of the vine dressers, who to compensate for the natural deficiencies of the soil constantly replenish it by basaltic earth and perform the entire labour of the vineyards with their hands like the vinedressers in the terraced vineyards on the precipitous banks of the Rhine, scorning ploughs and such like mechanical appliances.

In the Palatinate, which yields about a tenth of the entire wine produce of Germany, it is the practice to make the wine from a mixture of several sorts of grapes. Thus the Traminer is largely employed because it gives smoothness and body, the Chasselas being used to impart sweetness, and the Riesling for its perfume and the keeping powers it gives to the wine.

Bavaria also contributed some excellent samples of Stein and Leisten wine from the Hof Kellerei of the King of Bavaria in the castle of Würzburg, the combined flavour, fullness, and delicacy of which indicated the great progress that had been made of late years with regard to these wines. The so-called "Holy Ghost wine," and which was originally the only Stein wine sold in the squat bocksbeutel, now extensively used to palm off inferior growths as genuine Stein, was not represented at Vienna. One of the most noticeable of the Bavarian wines was a Hohenlohe-Langenberger, a white wine of the comet year, 1811, which although wanting in character proved remarkably well preserved, whereas an Erlenbacher of the same year, a red wine of the Odenwald which chanced to be uncorked at the same moment, was found to have lost all its colour and almost all its flavour.

From Baden came samples of Markgräfler-Hallingerberg one of the rare centenarian wines of the exhibition, having attained the ripe old age of 107 years, and one moreover which had sufficiently preserved its vinous character without adventitious aid as to merit the medal which was awarded for it to Blankenhorn and Co. of Müllheim. It was stated that new wines of the same type ordinarily contain no more than 12 degrees of absolute alcohol, equal to 21 degrees of proof spirit. The peculiarity of Markgräfler is its being made from the Chasselas grape, which highly esteemed as it is for eating rarely produces good wine. The same firm exhibited an Ihringen auslese from the vineyards at the foot of the Kaiserstühl, in the Black Forest, with a rich bouquet and a refined high flavour, still with a tendency to sweetness. The red Affenthaler grown in the neighbourhood of Baden exhibited no special character. A sample of 1868 vintage made from grapes separated from the stalks before being pressed proved a remarkable failure, and some wine of the following year, quoted, however, at merely half a florin per bottle, seemed almost as poor in character. For a Clevener of 1869, a neat pleasant wine but singularly spirituous, and some samples of Klingelberger Baron von Zorn obtained a medal for merit. Six medals in all were awarded for Baden wines, a similar number of exhibitors from the Grand Duchy being accorded honourable mention.

From the vineyards lying between Heidelberg and Zwingenberg along the western slopes of the Odenwald, the richly wooded character of which renders it one of the most beautiful in all Germany, came the locally celebrated wines of the Bergstrasse, the best of which, Hubberger, is grown in the neighbourhood of Weinheim. Of these wines, which resemble in character some of the inferior growths of the Rhine, and the fame of which could hardly have previously travelled far beyond the picturesque region of their native Odenwald, there was a collective exhibition by the vine growers of the district, two of whom were recompensed with medals for merit for the superior character of the samples of Kirchberger and Hemsberger they had contributed. It was with a white wine of the neighbouring Odenwald, that in bygone times the huge Heidelberg tun, holding its two and thirty thousand gallons, was accustomed to be filled. Würtemberg exhibited samples from the Riesling, Clevener, and Trollinger species of grapes, the former occasionally rather harsh, still at times with a very fine bouquet, while the Trollinger was even inferior to the German red wines generally.

The wines of the recently conquered provinces of Alsace and Lorraine naturally attracted more than ordinary attention. The samples were numerous, but simply a few exhibited any special character. Their principal merit is that spite of their ordinary indifferent quality they will keep for at least a generation. Certain of them made from the Riesling grape will carry their 30 years as jauntily as though they were merely three, retaining moreover their strong *pierre à fusil* flavour as in their most juvenile days. The collections exhibited by the communes of Rappoltsweiler and Reichenweyer were the most important, and had medals for progress awarded them. All the specimens, red as well as white, assimilated far more to the German than the French type, and as a rule they were estimated beyond their deserts owing to a certain sympathetic feeling on the part of both the French and German jurors which was easily understood. With the first it was, as it were, "Adieu!" or at any rate "Au revoir!" with the others "Willkommen!" Impartial judges however arrived at the conclusion that considerable improvements in viticulture are necessary before the provinces in question will occupy that rank among the wine producing districts of Europe, to which, climate, soil, and a favourable aspect for the development of the vine and its fruit entitle them.

Of the Rappoltsweiler wines the best were white varieties —Hunneweyers and Osterbergers and notably a fine Zahnacker—red wines being rare and generally inferior in Alsace. The few samples of mark from Reichenweyer comprised an excellent Schonberg Riesling, a St. Hippolyte, some fair Beblenheimers and Mittleweyers, all of them white wines, and both red and white growths from the Kaiserberg and Kientzheim, several of the former being remarkably good, having less of the harsh flavour common to both red and white varieties, from allowing the must to ferment too long on the skins of the grape. Other red wines of poorer qualities came from Ammerschwir, Walbach, and Olweiler, the remaining white ones of any character coming from Wolxheim, Bergholt-Zell, Sultzmalt, and Guebweiler, the last sending samples of its Oberlinger, and its famous Kütterlé, while Colmar contributed its Kissibél, and Türkheim an admirable wine with high flavour and perceptible bouquet. There were numerous samples from the Tokay grape, several Muscats, and some Malmsey and "strohwein" from Beblenheim, the more famous straw wines of Colmar and other districts enjoying a reputation for these *vins de liqueur* being unrepresented. Beyond the couple of medals for progress already mentioned, ten medals for merit were given to Alsace and Lorraine wines, which received moreover honourable mention in eight instances. The principal vines cultivated in Alsace are the Riesling, the Traminer, and the Elbling, but the system of training is one scarcely adapted to the climate, as it admits of many of the grapes growing at too great a distance from the ground, the consequence being that they ripen with difficulty and are often watery, acid, and flavourless. Before the annexation the Alsace wines, the price of which *in loco* ranges from two to three francs the gallon, used to be largely exported to Switzerland.

Beyond some "moussirender-wein" made up at Magdeburg, the only wine which Prussia proper sent to Vienna was of that famous Grüneberger growth which for a long period was the butt of the small wits of Berlin; but which had so far improved in quality of late years as to have been found deserving of a medal for merit at Vienna, awarded to Herr Ravené for the samples of Theresienberger of 1868 exhibited by him. This wine comes from Prussian Silesia, and is grown just within the 52° of north latitude, the most northern point contributing wine of its own production to the Vienna Exhibition. The same district also sent some samples of sparkling wine. The Grüneberg vineyards yield about 150,000 gallons of wine yearly.

I am happy to chronicle that only one exhibitor of wines from Hamburg obtained a medal, and further that this was for a genuine wine exposed under its true name. On the other hand a Würzburg exhibitor of an imitation wine, was I regret to say, considered deserving of honourable mention.

The alcoholic strength of the principal German wines ranges between 15° and 25° of proof spirit. The grand wines of the Rheingau commonly contain from 20° to 22°; but in exceptional instances as many as 25°, the red varieties indicating about 20°. Some of the Moselle wines contain as few as 17°, while the robuster varieties show as many as 22°. The best of the Saar valley wines average from 20° to 21°, the finer Bavarian growths ranging from 21° to 25°. The Baden wines, both red and white, take the wider range of from 17° to 22°; while as regards those of Würtemberg some of the white varieties contain as little as 15 per cent., and others as much as 25, the red averaging merely 18 per cent. of proof spirit.

III.—*Sparkling Rhine, Moselle, and other Wines.*

The sparkling wines from all parts of Germany, including the Rhine and the Moselle, the Nahe valley, Bavaria, Würtemberg, Saxony, Hesse-Nassau, Alsace, &c., were exceedingly numerous and far more difficult to assign proper rank to than the still varieties. Many of them showed that marked progress had been made by the manufacturers of these wines of recent years. If the lightness and delicacy of flavour of the finer Champagne brands were in a great measure missing, the better varieties had the merit of retaining their own distinct individualities, instead of being as they too often formerly were poor imitations of a wine which in its highest qualities they can scarcely hope successfully to emulate. The artificially scented Moselle wines were as usual the lightest of all, still the samples from the Rhine, with their rich natural perfume and altogether of a higher character were much less heavy than those from other districts. The specimens which secured medals for progress were exhibited by Herr Kroté of Coblenz, Lauteren and Son of Mayence, the Hochheim Association, and Herr Müller of Eltville, the latter of whom exposed numerous varieties, the highest priced of which was a Blume von Johannisberg at 60*s.* the dozen. The wines of Dietrich and Ewald, who obtained a medal for merit, ranged from 36*s.* to 48*s.*, the cheapest of all being sparkling Hocks, Schiersteiners, and Moselles at a couple of shillings the bottle. The best Bavarian effervescing wines came from Würzburg, and were found of such a superior character that a medal for progress was given to their exhibitor, Herr Siligmüller; the best Wurtemberg samples were from Esslingen, the best Moselles from Trêves and Coblenz. Stock and Sons sent the most satisfactory collection of the sparkling wines of the Nahe valley, and Herr Hatterer of Berbheim the best specimens of those of Alsace. Silesian Grüneberg also contributed some samples of excellent quality, and in all five medals for progress, and twice that number for merit, were distributed among exhibitors of German sparkling wines, none of the red varieties of which were deserving of recognition.

During the past few years the production of these wines has about doubled, and is still steadily on the increase. At the present time it forms a grand total of upwards of a couple of millions of bottles annually, three-fourths of which are exported, principally to England.

The cultivation of the vine is distributed over the following states of the German Empire, the vineyard area of which has been extracted from the latest available official and other documents. The estimated production has been based in every instance upon an average of several years, including the most recent for which returns have been published.

States.	Vineyard area in acres.	Produce per acre in gallons.	Total Produce in gallons.
Prussia—The Rheingau -	5,424	204·8	1,108,477
„ The remainder of Nassau.	3,096	197·9	612,784
„ Around and below Coblenz, including the Ahr valley.	10,290	222·8	6,831,800
„ The Upper Moselle	9,425		
„ The Lower Moselle	5,548		
„ The Saar and Nahe valleys, &c.	5,844		
„ Silesia, &c. - -	14,418	79·3	1,129,624
Hesse - - - - -	49,185	124·6	6,133,126
Bavaria.—The Palatinate -	26,258	120·2	3,156,909
„ Franconia and Suabia	28,289	133·5	3,779,500
Baden - - - -	50,001	328·8	16,441,222
Würtemburg - - -	54,862	120·8	9,627,931
Alsace and Lorraine - -	72,424	379·6	27,496,481
Total -	335,064	—	763,17,204

On comparing the above table with the one on p. 26, it will be noticed that the entire annual wine production of the German Empire amounts to only one-fifteenth of an average vintage in France, and to little more than one-fourth of last year's yield from the department of the Hérault alone. The recently annexed provinces of Alsace and Lorraine supply moreover upwards of one-third of the total produce. During the year 1870 Germany imported 8,341,664 gallons of wine, and exported only 4,014,563 gallons. Still this, combined with its then annual production, averaging about 50 millions of gallons, only allowed for the consumption of about a gallon and a quarter by each head of the population.

At Vienna there were 256 exhibitors of wine from Germany, contributing amongst them 618 samples of white, 78 of red, and 131 of sparkling wines, or 827 specimens in all. Of these, 21 exhibitors received medals for progress, of which eight were given for Rhine and Moselle wines, and 65 medals for merit, 29 of which were for Rhine and Moselle wines, while 71 had honourable mention made of their samples. In proportion to the number of white wines exhibited, remarkably few were found positively bad in quality, in comparison with those of other countries.

THE WINES OF SWITZERLAND.

Switzerland, environed as it is by three such celebrated wine producing countries as Italy, Germany, and France, and distrustful it would seem of her own capabilites in a similar direction, sent merely a few samples of her wines to Vienna, and these unfortunately not her best. Of fifteen exhibitors contributing forty-seven specimens nine were from the canton of Thurgau, the wines of which occupy simply the third rank. The excellent red wines of Neuchâtel and the white wines of the Vaud, the best which Switzerland produces, were represented by a single exhibitor each. Three other exhibitors belonged to the Valais, and the remaining one to Ticino. There were no specimens either from the Rhine or Lake Leman, not a sample of Yvorne, or of the so called "wine of blood," of which the guide books speak, and reported to come from vineyards in the neighbourhood of Basle, and on the site of some desperate struggle for freedom which has its place in the annals of Swiss independence.

The sample which met with most approval was a Vaud white wine, delicate, spirituous, and aromatic and only slightly acidulous, termed La Côte, vintage 1870, and which came from Loys Châtelanat in Perroy 2,700 feet above the sea level, and was rewarded with a medal for merit. Some red and white Thurgau wine of the years 1865 and 1868 exhibited by Orlandi of Mammertshofen, and all the samples of which were classed 1, received a medal for progress. The excellent condition of these wines proved that they had been well made and subjected to judicious after treatment in the cellar, which was by no means the case with several of the Valais samples, which were not merely cloudy but had a disagreeable odour. Four other Thurgau exhibitors obtained medals for merit, three for red wines from the blue Cleves grape and one for white, and all of 1865 and 1868 vintages, while honourable mention was made of some red Karthauser and Hallauer of the year 1870, as well as of three other red wines, one of the vintage of 1834 from Frauenfeld, all belonging to the same canton. If the exhibitors and samples were relatively few the proportion of rewards they received was large, comprising as these did on the whole one medal for progress, five medals for merit, and honourable mention in seven instances.

One drawback of the Swiss red wines is their deficiency of tannin compared with those of more southern countries, and although red wines can be excellent enough without the presence of this acid, which is a continual cause of change with many wines, any deficiency interferes materially with their keeping powers. If a wine with plenty of tannin requires time to develop all its higher qualities, this disadvantage is certainly compensated for by its retaining them in perfection for the greatest possible length of time. The alcoholic strength of the Swiss wines ranges from as low as 10 to as high as 25 per cent. of proof spirit.

Respecting the wines of Switzerland one of my Vienna colleagues, Herr Adolp Ott, of Berne, writes to me as follows: "The best red wines come from the canton of Neuchâtel, and the Cortaillod and the Faverge of a ruby colour and Burgundy like flavour occupy the first rank; after these may be placed the wines of Boudry, Concise, and Colombier. The canton of Vaud is distinguished for its white wines, including those of Deselay, St. Saphorin, Chebres, and La Côte, fine, strong, and aromatic wines with much body, very little acidity, pleasant tasting, and not unlike some of the Rhine growths. Among the red varieties are the highly spirituous and rich coloured wines of St. Prex and Salvaguin made from the Burgundy grape. Geneva produces the celebrated and equally fiery red wine known as Gringet, while Montreux at the upper end of Lake Leman is noted for its table wines, with one or two others of a superior character, such as those of Aigle and Yvorne, gold coloured, a little spirituous, sub-acidulous, and agreeable in flavour.

"The canton of Valais produces wines which may be classed among the best growths of the country, notably its liqueur like Malvasia, which unites the richness of Tokay to the force of a spirituous southern wine, the variety called Glacier held in considerable local esteem, and the growths of Coquembay and La Marque. The red wines include those of Visp, Baillio, and Ardon, which are strong and full bodied and endowed with good keeping powers. The Grisons yields but few wines; the best known are the somewhat powerful red Oberlander, the Costamser, and the white variety termed Completer. Schaffhausen produces only ordinary growths including the red Hallauer and the white Siblingener, Aargau simply some common table wines, whereas the canton of Ticino, although viticulture and vinification are but in their infancy there, already yields such promising red wines as those from Mendrisio, Locarno, Bellinzona, and Lugano. A fine field exists here for a person of enterprise who would give his attention to the cultivation of the grape and the making of wine on scientific principles, now that railway communication with Interlachen is on the eve of being assured."

The area of vine cultivation in Switzerland is estimated at 80,000 acres and comprises 1·60 per cent. of the land under tillage. In the canton of Ticino alone there are nearly 20,000 acres of vineyards, and in those of the Vaud and Zurich upwards of 14,000 and 13,000 acres respectively. The greatest altitude of any Swiss vineyard is 3,000 feet above the level of the sea. The annual yield of wine ranges from 26,000,000 to 30,000,000 of gallons, representing a value of from 1,100,000*l.* to 1,350,000*l.* The best wines command about half a crown per bottle retail. Excepting the Neuchâtel Champagne scarcely any Swiss wine is exported, the production in fact falling short of home requirements, which are supplied to the extent necessary from France.

THE WINES OF AUSTRIA.

I.—*Wines from the North.*

THE wines of Austria are as diverse as its population. At the extreme south they are so dark and full-bodied that when mixed with an equal quantity of water they are quite as deep in colour and as spirituous as the ordinary wines of Bordeaux, while in less favourable districts they are excessively poor and so sour as to rasp the tongue like the roughest cyder. Many have the luscious character of Constantia and the Muscat growths of Frontignan and Lunel; several on the other hand, are disagreeably bitter, others again are so astringent as to contract the windpipe while swallowing them, whereas a few of the lighter varieties possess the delicacy, if not the fragrance, of certain growths of the Rhinegau. It must be confessed, however, that, although the specimens were remarkably varied and numerous, the better qualities were extremely rare.

Lower Austria.—Of the various wines which came from that mere fraction of the empire known as Lower Austria, those of Vöslau and Gumpoldskirchen, in the vicinity of the fashionable and picturesque summer watering place of Baden to the south of Vienna, and of Klosterneuburg on the banks of the Danube north-east of the capital, attracted most attention. From Vöslau, which produces the best Austrian red wines, came a collection of Herr Schlumberger's finest growths, white as well as red, including Vöslauer Ausstich, Goldeck and Steinberg. The red varieties are produced from a combination of the early blue Portuguese, Burgundy, St. Laurent, and Limberger grapes, the first-named species evidently predominating and imparting, spite of a slight astringency, a soft sweetish taste to the wine, which is very deep in colour and full bodied, has a fragrant fruity bouquet and readily rounds off any roughness pertaining to its youth as it grows old, when the finer qualities develop considerable *finesse*. It improves greatly by being kept from three to four years in cask, being continually racked during that period, and the same number of years in bottle. And yet some wines of 1869 and even 1872 exhibited considerable delicacy. The finest, however, that we tasted was more than 20 years old. Of white Vöslauer made from the Riesling, Traminer, and Rulander grapes, there are the still and the sparkling varieties, both being amber tinted, and exhibiting considerable vinosity, the still Steinberger cabinet, as it is called, resembling the white wines of the Côte d'Or. Some 20,000 hogsheads of Vöslauer, only a portion of which comes from the place itself, the remainder being vintaged in the neighbouring localities, are annually produced. By far the larger portion is consumed in Austria, the remainder, principally red Vöslauer, being exported to Germany, Russia, Turkey, Egypt, and Great Britain. The travelling qualities of the wine were put some years ago to the test of a three years' voyage round the world in the "Novara" frigate, and came back again not merely unimpaired but greatly improved. The yield from the Schlumberger vineyards, comprising exclusively the first growths, is about 1,000 hogsheads, and the price of the wine duly matured in cask ranges from *15l.* to *20l.* per hogshead, the finer qualities mounting up as high as 30*l.* White Vöslauer is somewhat dearer than the red, and the sparkling wine commands from 46*s.* to 64*s.* per dozen. Herr Schlumberger being a member of the wine jury, his samples were of course *hors concours*, but a couple of other exhibitors of Vöslauer, Herren J. Romer and Sons, and A. Schneider, received medals for progress for their collection of Austrian wines generally, in addition to which two Vöslau wine growers had honourable mention made of their products.

The specimens of Gumpoldskirchner, one of the best white wines which the archduchy of Austria produces, and made, as a general rule, from the Zierfandler and Riesling grapes, were very numerous, and on the whole of admirable quality, certified by as many as five medals for merit being distributed among their exhibitors, six others of whom had honourable mention made of their samples. Some remarkable specimens of Gumpoldskirchner auslese were contributed by Herr F. Faseth, including gold Riesling, Muscat, and silver Riesling, all beautiful wines of singular softness and delicacy. The first, which was the driest of the three, had a pleasant subdued sharpness of taste; the next was a trifle sweet, with the same agreeable suppressed acidulous flavour, while the third, which was also inclined to be sweetish, had a slight bitter taste, which gave it considerable character. All these wines were of the first order, comparable indeed with the finest Sauternes, and were rewarded by a medal for merit. Ordinary Gumpoldskirchner is a delicate pleasant wine with no high character, still with none of the harshness or poverty of flavour common to the majority of growths in the neighbourhood of Vienna. Traiskirchen sent some samples of the better kind, to one of which a medal for merit was given.

From the quaintly carved mediæval tuns in the vast three-storied cellars of the ancient and palatial Augustine monastery of Klosterneuburg, in the neighbourhood of Vienna, and to which upwards of two-thirds of the immediate environs of the Austrian capital are said to belong, came a large collection of samples, the superiority of which over the Klosterneuburger exhibited by private growers was very marked. They were, without exception, sound well-made wines, one or two even possessing considerable delicacy, the best being perhaps a Riesling of the vintage of 1868. Not only had these wines been vintaged with care, but it was mentioned that their ordinary crude character had been effaced by scientific treatment either during the process of vinification or else in the cellar, which included the addition of a moderate quantity of alcohol—five per cent. or thereabouts. However much the addition of spirit to wine may ordinarily deserve to be deprecated, it is quite certain that the effect in this instance had been to render wines that are commonly disagreeably acidulous and next to worthless, pleasantly palateable.

The treatment these Klosterneuburg wines undergo is due to Baron von Babo, principal of the "School for Vine Cul-"tivation and Cellar Management," an imperial institution, although attached to the conventual establishment. In the adjacent vineyards under the Baron's charge, numerous varieties of vines are planted and cultivated on thoroughly scientific principles. The institution had a special exhibition at the Vienna Industrial Palace, in one section of which vines were shewn growing in every variety of soil, such as loam, sand, gravel, lime, stones, and even coal. The vine planted in the latter formation required of course occasional artificial moisture, and the plant itself was deficient in strength. The purpose of the exhibition was to show that the vine will really grow in all kinds of soil, though in some very much better than in others.

From Nussdorf, north of Vienna, and from Mödling Rudolfsheim, and Brunn, on its southern side, came various white wines ordinarily of very indifferent quality, being cold and spiritless, in fact *vins verts* in the fullest sense of the term. The best specimen of Nussberger vintaged in 1868 came from the monastery of Zwettl and had honourable mention made of it. Similar recognition was accorded to six samples from the remaining localities, which proved superior to the general run; also to various white wines from Guntramsdorf, Enzerdorf, Pfaffstetten, Grinzing, Landstrass, Hangsdorrf, and Mailberg, all in the environs of Vienna, as well as to some straw wine, which is rarely made in Lower Austria. A medal for progress was given to Count Kinsky for his excellent samples of red Matzner, produced from the early blue Portuguese and some black French grape, and medals for merit were awarded for samples of Mauerer, of white Strasser from Shiebbs, and of another white wine grown at Hadres, on the road from Vienna to Krems.

There were numerous samples from Retz, Retzbach, and Markersdorf, to the north of Lower Austria, where what pass under the name of the white country wines are produced in great abundance, the predominating vine in the mixed plantations being the Veltliner, while a variety of the Muscat, and the Traminer are frequently, and the Riesling rarely met with. For these wines Herr Witzmann secured a medal for progress, four medals for merit being distributed among other exhibitors of the district. A medal of the last-named description was given for a well-made and slightly spirituous wine, of agreeable flavour, and with a slight bouquet, vintaged in 1869 at Langenlois. Several Vienna wine merchants rather unfairly secured rewards for exhibits of Hungarian wines, and from the little town of Brück, on the river Leitha, which forms for a certain distance the boundary between Austria proper and Hungary, came several samples of Hungarian Ruster ausbruck, of which honourable mention was made.

The vine is cultivated in Lower Austria on the banks of the Danube, and of the smaller rivers and streams running parallel with it, the vineyards, of which those in the southern part of the archduchy have by far the finest aspects, stretching alike over hills, slopes, and plains, the steeper heights being laid out in terraces. The grapes principally used for the white wines are the Zierfandler, the Veltliner, and the Riesling; while for the red, the prevalent varieties are the early blue Portuguese, the blue Frankish, as it is termed, the Schubkörner, and of late years the black Burgundy.

Vineyards planted exclusively with one kind of vine are very rarely met with, different species being generally indiscriminately mingled. In the north, as already observed, the Veltliner predominates, while in the south the Zierfandler and the Riesling are the more general. In the immediate neighbourhood of Vienna the Riesling, Traminer, and other varieties, are found in connexion with the original vine of the province, namely, the Austrian white.

With certain exceptions, the wines of Lower Austria are at their best when three years old; after this period they are liable to turn mouldy, ropy, or sour. If the white varieties are legion, the red are exceedingly limited, being confined simply to Vöslauer, Matzner, Merkensteiner, Falkensteiner, and Schrattenthaler.

Lower Austria produces on the average 20,000,000 gallons of wine annually, and between the years 1870 and 1872 the price ranged from 1*s.* 8*d.* to 3*s.* 10*d.* per gallon.

Moravia.—The samples of Moravian wine were necessarily not particularly numerous, the vine growing districts of that province being limited to the banks of the Schwarzava, Zwittava, Iglava, and Thaya rivers, in the southern portion of their course, and only extending from Baumöhl, near the frontier of Lower Austria, to Sumic, on the confines of Hungary. Some little wine is produced north of Brünn, but by far the greater quantity is vintaged between that town and the borders of the archduchy of Austria.

The best specimens came from the neighbourhood of Bisenz, on the line of railway from Vienna to Olmutz, and from around Joslowitz, lying between Grussbach and Znaim, the growths of the former locality, in their spirituous nature, resembling the Hungarian wines, the others assimilating in their raw and *pierre à fusil* flavour to those of Lower Austria. Count Reichenbach received a medal for progress for Bisenz wines, and for improvements effected by him in the old-fashioned system of viticulture and vinification, Count Hompesch-Bollheim, of Joslowitz, obtaining a like distinction.

The wines of Baumöhl, Rausenbrück, Schattau, and Gnadlersdorf, vintaged to the extreme south of the province, almost on the frontiers of Lower Austria, and known as the Moravian mild wines, were represented by a variety of samples, one of them a Gnadlersdorfer of the year 1859, the majority being only a few years old. Three medals for merit were given to exhibitors from Schattau, and medals of the same class were awarded for Znaim, Neunmühlen, and Luggau wines.

There is a vintage law in Moravia forbidding the gathering of the grapes prior to the time officially fixed upon, but it is very little observed. In Znaim the local custom prevails of allowing widows and orphans to complete their vintage before anyone else commences. The primitive practice of crushing the grapes with a couple of pestles is common throughout Moravia, where all that relates to vinification in in a very backward state. With occasional exceptions, the Moravian wines are offered for sale when only a few months old, and are commonly consumed within the year, simply because the majority of them will not keep beyond. The total quantity of wine produced in Moravia during the year 1872 was about 2,600,000 gallons, the price of which ranged from 11*d.* to 3*s.* per gallon.

Bohemia.—In Bohemia, where beer is the staple beverage, the cultivation of the vine for the purpose of vinification is not without importance, and during the past seven years a rather good wine of the Burgundy type, known as Labin, and taking its name from the river Labe or Elbe, has been produced there from the Burgundy grape, a species of vine which was originally imported into Bohemia direct from Burgundy several centuries ago. Labin, of which there is a white variety as well as a red, comes from the vineyards in the Melnik district, near Prague, where a considerable amount of red wine is produced, with a small quantity of very good white from the Riesling, and a combination of the Riesling, Sylvaner, and red Traminer grapes. A few years added on the age of these wines greatly improves their flavour and developes a decided bouquet. Other white wines from the green Traminer and the Chablis grape are of inferior quality.

There were only a couple of exhibitors of wine from Bohemia, one from Leitmeritz, who sent samples of Cernesēker, a wine of some local repute, and Prince Ernest Windischgrätz, whose numerous samples of Trojer from his Troja vineyards near Prague, had honourable mention made of them.

In 1870, Bohemia produced rather more than 80,000 gallons of wine, which when new varied in price from 2*s.* 4*d.* to 4*s.* 6*d.* per gallon, while wine from six to twelve years old commanded from 3*s.* to 6*s.* 6*d.* per gallon, according to quality.

The province of Voralberg, lying north-east of the Tyrol, sent no samples of its wine to Vienna, and yet it produces nearly four times the quantity Bohemia does. Unfortunately, however, the system of vinification prevailing there is of the most primitive description. Grapes and stalks, after being left lying in heaps for three days after the vintage, are thrown together into the vats, and the mass is allowed to ferment in little wooden huts, the temperature of which is never regulated. As a consequence, the wine suffers from too much heat when the hot south wind prevails, but more frequently from too great cold, and indeed is known to have been even frozen.

The duchy of Bukowina at the extreme eastern end of the Austrian empire, grows considerable quantities of grapes, chiefly however for table purposes, and such little wine as is made there is extremely poor in quality.

II.—*Wines from the South.*

Styria.—By far the finest wines produced by the Cisleithan fraction of the Austrian Empire, come from the ancient duchy of Styria, which, owing to its peculiar situation between the Alps and the eastern steppes, possesses great varieties of climate, from the frigid temperature of the mountain regions, to the genial warmth of the lowland districts, and secures a happy proportion of heat and moisture, highly favourable to the cultivation of the vine, and conducive to the development of the grapes, and more especially of their full flavour.

This variety of climate naturally occasions a great variety of growths. The finest of all the Styrian wines is the Luttenberger, a really splendid wine, produced, as its name implies, on the slopes of the Luttenberg, at the south-east extremity of the province, and made from the Moslavina, or Mosler species of grape, which is the same as the Furmint of Hungary, and is probably the one most extensively grown throughout the province. Round the Luttenbergers proper, one may group half-a-dozen semi-Luttenbergers, known as Wallershak, Kaisersberger, Grünauer, Jerusalemer, Eisenthurer, &c., vintaged in the vicinity of the more famous vineyard, and produced from the same widely-spread Mosler grape. The choicest Luttenbergers displayed at Vienna were those of Prince Conrad of Pettau, Baroness Werner of Friedau, Herren Kleinoscheg of Graz, and the Duke della Grazia of Brunnsee, each of whom was awarded a medal for progress. Their wines were rich and syrupy, of decreasing degrees of sweetness, but invariably of great volume, and with a fine spirituous and sub-acidulous flavour. Scarcely if at all inferior were the more mellow samples, in which a suggestion of true Tokay was just perceptible, sent by the wealthy Benedictine Abbey of Admont, and rewarded by one of the nine medals for merit distributed among the exhibitors of these fine wines, which received honourable mention moreover in nine other instances.

Among the numerous varieties of Luttenberger which attracted attention, one may instance the Jerusalemer, the Wallershak, and the Weinberger of Prince Conrad, the two last named very slightly sweet, but of marked flavour. There were also samples of Kaisersberger, a wine of some character, which procured Herr P. Sonnhammer a medal for merit, and also of Grünauer, another sweetish wine, which obtained a similar medal for its exhibitor. Of the few Eisenthurers, delicate and rather dry white wines, the finest were sent by Herren Kleinoscheg of Graz, who, as already mentioned, received a medal for progress.

The wines of the Radkersburg, Schmitsberg, Rittersberg, Radiselle, and Pickern vineyards, together with a few of the Sauritsch wines, also produced from the Moslavina grape, showed many of the characteristics of Luttenberger. Some of the recent vintages contained a very large amount of sugar, and it would appear that they remain sweet for nearly three years, during which time they are greatly in request for mixing with other wines. They reach maturity at four or five years of age, when the peculiar acidity pertaining to the Mosler grape becomes very prominent, occasionally rendering them harsh, in addition to which they exhibit great spirituosity. The finest Radkersburger was sent by Count Wurmbrand, who secured a medal for merit for his Eichberger growths.

The Marburg wines, belonging to the same category, and produced on the southern and eastern slopes of the long chain of the Bacher mountains, which extend southward in the direction of Carinthia, were represented by numerous samples, the finest being contributed by Dr. Othmar Reiser, who secured a medal for samples of Pickerer from the Traminer, Mosler, and Welsch Riesling grapes respectively. These wines were of full yet delicate flavour, the Riesling variety being the lighter and tasting remarkably fresh to the palate. Herr Pfrimer, for some samples a trifle less choice, received a medal for merit. A similar medal was given to an exhibitor of Marburg Sauritscher wines, which were slightly rich, and at the same time pleasantly sharp in flavour.

The Styrian Muscats which are characterised by a strongly developed perfume, and have lately come into great request, fetching from 4*s.* 6*d.* to 6*s.* per gallon, are principally produced on the slopes of the central Alpine chain, in the direction of the river Drave. The jury awarded medals for merit to Herr Carneri of Wildhaus, and to the Styrian Wine Company, for some choice and remarkably luscious samples of these wines.

Another class of the white growths of Styria came from the Windisch hills, and the Kolleser, Pettauer, and Sausaler, vineyards, which furnish very good table wines, although a little deficient in character, owing to the varieties of vine being very much mingled. The wines produced in the north-eastern corner of the duchy between the Mur and the Hungarian border were of the same description. Two medals for merit were given to Pettau exhibitors, and honourable mention was made in numerous instances, notably of five Windischbüchler wines from St. Georgen and Mureck on the Windisch hills.

No higher distinction than honourable mention was conferred on the Pettau Sausaler growths which with the Vinarier of Gonobitz and the Marburg reds are the most palatable of the Styrian red wines. The predominant vine on the Sausaler mountain is the blue Wildbacher an abundant bearer, which is cultivated at 1,500 feet above the level of the sea, and yields a fresh strong wine with much the same body and astringency as the Palus growths of the Gironde. Although the Wildbacher may be cut low like the Burgundy vine, in Styria it is frequently trained over the houses, which as the autumn approaches often disappear beneath the dense foliage and clustering fruit yielded by this prolific vine. The Gonobitz red wines from the Vinarie mountain are produced from the small black Kauka grape, of an agreeable although peculiar flavour. The wines themselves proved rather sweet, and were distinguished by a singular spicy taste. Of the few specimens exhibited, two received honourable mention including one exposed by Prince Hugo Windischgrätz. The Marburg reds, more highly appreciated, secured a couple of medals for merit.

The Styrian Schiller wines—so called from their pale colour—which came from the central regions of the duchy between the rivers Mur and Cor and the Stainzer Alps, and which, like the Sausaler, are produced from the blue Wildbach grape, although containing very little alcohol, were only agreeably acidulous. A medal for merit was awarded to Herr Heinrich Fink, of Ligist, for some samples of these wines, honourable mention being made of other specimens from the Schwanberg and Hochenburg.

There are some two hundred different kinds of vine grown in Styria, the grapes of which differ in quality, flavour, and time of ripening. After the Mosler, which is the most generally cultivated, come the white Heunisch, the blue Wildbach, the white Wippach, the red leaved Kauka, and endless other varieties. The small Riesling, blue and grey Cleves, and blue Portuguese, all of which are superior to the native vines, have been largely introduced into Styria of late. Some of the vineyards are laid out in terraces banked up with turf, others are often extremely steep, and provision has to be made against the washing down of the soil by cutting deep trenches for the water to run off. What is termed the colonial system prevails in numerous districts, the colonist receiving from the proprietor of the vineyard a house, a piece of ground for his own use, one or two cows, and fuel, and undertaking in return for this, and a small fixed sum of money, to do all the work in the vineyard, excepting the digging and the vintaging. Half the manure is used for the vineyard and the other half for the vine dresser's own field. It is only on a few large estates that the grapes are picked and pressed by grape mills, they are usually thrown indiscriminately upon the press floor or into vats, where the *must* is expressed by their being trodden by barefoot labourers.

The average quantity of Styrian wines produced is nearly 17,000,000 gallons annually, and the price on the spot ranges from 11*d.* to 1*s.* 10*d.* per gallon. Very little wine indeed is exported. Of late years sparkling wines have been made in considerable quantities, a large Styrian champagne factory existing at Göstling near Graz.

German and Italian Tyrol.—With the samples of wines sent by the Italian and German districts of the Tyrol to Vienna the proportion of awards was greatly in favour of the former. While the German exhibitors succeeded in securing only one medal for merit, and four diplomas of recognition, their Italian rivals carried off three medals for progress, and five medals for merit and had honourable mention made of their samples in nine instances. In both the German and Italian Tyrol the vine is often cultivated at a considerable altitude, but in the former province sharp east winds, rain and drought are frequent, and naturally do much damage which, combined with the deficiency of soil, chalk being far more generally the prevailing stratum in the Italian than in the German region, sufficiently explains the inferiority of the Botzen and Meran growths to those of Trent and Roveredo.

From the Botzen district, which is the most important of the German Tyrol both from the quantity and quality of its produce, and which comprises the northern valleys of the Adige and the Eisack, came some samples displayed by a Tyrolese society for the cultivation of the vine and for which a medal for merit was awarded. These wines were made from the peculiar large berried blue and white Tyrolese grapes of which there are many varieties, including the Lagrein, the Vernatsch, the Geschlafene, the Tirolinger (more generally known as the Trollinger) and others. Parenthetically it may be mentioned that the Traminer grape is not to be found in its 'presumed' native home, the vineyards around Tramin, the last German village south of Botzen.

The pure Lagrein wines, which were dark, strong, and acidulous, seem to be generally used for improving weaker growths. Such as had been vintaged on the hills were rather fragrant, but the others were without perfume. The Vernatscher red varieties were somewhat sweet, a circumstance due to the custom of filtering the *must* through sacks after the first turbulent fermentation and suppressing all further ebullition. The best white wines in the collection were from the Ferlaner, Leitacher, and Riesling grapes, and were all of a deep tint arising from the practice of throwing the skins of dark grapes, such as the Lagrein and Negrara, upon the lighter fruit when mashed, to heighten the colour of the must. Those from the hills were fiery, strong, and only a trifle acidulous, the produce of the plains proving invariably weak and not unfrequently sour. The other samples from the German Tyrol that secured awards came from Toggenburg and Rametz, honourable mention being made of some Toggenburger, Frainsteiner, and Gross-Riesling growths, and of some red Rametzer produced from Burgundy grapes. One or two samples of Ausbruch wines had been sent, but they were of a very poor quality.

Among the specimens from the Italian Tyrol, where the vine is cultivated along the banks of the Adige, and the valleys formed by its confluents, mostly among other crops in fields and meadows, those of Roveredo, famous for its extensive rearing of silkworms, proved to be the finest. From the vineyards of Isera, close to that locality, came some samples of Negrara red wine, from the grape of the same name, of delicate flavour and brilliant colour, for which one exhibitor, Count Bossi Fedrigotti, secured a medal for progress, and another, Count Alberti Ruggero, a medal for merit. Then there were specimens of Maizemino, a good red wine of the Médoc type, mostly grown in the plains; some of which vintaged in 1867 and 1869 was of excellent quality, the former showing that it greatly improved by moderate keeping. Examples of the produce of the Burgundy, the Portuguese, the Radazka, and the Riesling vines grown in the vicinity of Roveredo were also exhibited, and the one furnished by the Portuguese grape secured a medal for merit, while honourable mention was made of the wines vintaged from the Burgundy and Riesling varieties.

The samples from the ancient Etruscan city of Trent, where the famous Œcumenical Council of the sixteenth century was held, were scarcely inferior to those from Roveredo, and medals for progress and merit were awarded to the Agricultural and Œnological Societies respectively for their very complete collections of the wines of this district. The Maizemina and (as the Trollinger is here called) the Tiroldiga grapes furnished the choicer red wines; the best white varieties being produced from the Nosciola and Peverella vines. In addition to these awards a second medal for merit was secured by a Trent exhibitor, and honorable mention was made of seven others. One naturally felt special interest in some red wine from Toblino, a locality with which recollections of the author of the Inferno are associated, but it was only deemed deserving of an honourable mention. The remaining award for Italian Tyrolese wines was a medal for merit, granted to Signor Antoni Gelmini for a sample of straw-wine.

In the German region of the Tyrol, the vines, white and red, as well as late and early varieties, are planted indiscriminately, and are principally trained on long arbours or pergolas, a system which guarantees a good yield of fruit, but does not improve its quality. In the districts of Trent and Roveredo the Italian garland system of culture, which consists in training the plants to poles from 10 to 12 feet in height, prevails. Both systems, however, are mingled over some few miles of territory in much the same way as the two nationalities are.

Vinification is still in a backward state in both regions. In the German Tyrol the *must* is allowed to ferment on the grape skins for four or five weeks, when the wine having become clear is drawn off; a few choice varieties only being passed through the grape sieve after being pressed, to separate them from the stems. In the Italian district the better varieties of grapes are picked from the stalks before being musted, and both red and white wines are generally drawn off after three weeks to admit of poorer wine being poured on to the murk of the best grapes, which ferments again. The average prices of the German wines has varied during the past three years from 1*s.* 7*d.* to 2*s.* 6*d.* per gallon, and of the Italian growths between 11*d.* and 1*s.* 3*d.*, rising for a short time in 1872 to 1*s.* 8*d.* The total produce of the two provinces in 1870 was between 9 and 10 millions of gallons.

Illyria.—Only a few of the samples sent to Vienna from the three Illyrian provinces of Carinthia, Carniola, and Küstenland, which latter comprises the districts of Istria, Trieste, and Görz, were judged worthy of special recognition. In Carinthia, the cultivation of the vine is extremely insignificant. The great altitude of the province, which at its lowest point is 1,060 feet above the level of the sea, its unfavourable climate, including often long and severe winters attended by continuous snow, prevent it, spite of its southern latitude, from taking any important place among vine growing regions. The only vine district of any extent is the Taun valley, at the foot of the Karawanken Alpine range, where a passably agreeable wine of a full and occasionally very dark colour, known under the name of Sittersdorfer, and which enjoys good repute throughout the province as a stomachic, is produced; a light Schiller wine also comes from two small vineyards in the neighbourhood of Bleiburg. The prevailing vine is the blue Wildbach intermingled here and there with a few Gutedel, blue Clevener, and blue Portuguese plants. At vintage time the domestic servants gather the grapes, which are carried in baskets to the "dosser," bruised with a pestle, and then emptied into fermenting vats, covered with perforated lids. In localities where common presses are in use, a single press and cellar frequently serves for several growers. Such slight merits as the Carinthian wines displayed, were amply recognised by honourable mention being made of a collection of samples sent from Klagenfurt, the capital of the province.

The awards for Carniolan growths were more numerous. A medal for merit was given for some samples of Oberfelder-Kindermacher, a mild agreeably flavoured wine from the district of Wippach, which differs from the other regions of Carniola by its strange climate. Girt with mountains, the vineyards, in which the black Rebula and Osiss and white Cernile are the principal vines cultivated, are often covered after a severe storm with masses of rock, floods of water, and layers of sand, in addition to which at certain seasons the north-east and south-east winds are very violent, raising veritable whirlwinds, and blowing down or tearing up the espaliers and arbours of the vineyards, and necessitating the selection of only the most sheltered spots. From this unpromising district came two principal kinds of wine, known as the mountain and plantation growths, the former of various golden shades of colour, and containing besides a fair amount of alcohol, a considerable quantity of tannin, and but very little cream of tartar or bouquet, the latter deficiency being due to the excessive mingling of the vines. The plantation wines proved to be for the most part light Schillers. In addition there were a few samples of Piccolit straw wine, said to have been known among the Romans, the Empress Livia Drusilla, wife of Augustus, we are told, giving a decided preference to it on account of its mild sweet flavour. The price of the Wippach mountain wines ranges from 1*s*. 1*d*. to 1*s*. 5*d*., and of the plantation from 8*d*. to 1*s*. 1*d*. per gallon.

From Gurkfeld, in Carniola, came Stadtberger and Bergama wine, with certain growths of St. Cancian and Möttling. These wines were Schiller, golden, and almost white in colour, the latter, however, becoming darker with age, and all being distinguished by a refreshing acidity. The older vintages had greatly improved both in alcoholicity and flavour, but very few of them had any bouquet, owing to the indiscriminate mingling of different kinds of grapes in the vineyards, and the great varieties of soil and aspect. The Zelenika (great Grünhamer) wines had the most perfume, their aroma resembling that of the Riesling growths. The price of these wines varies from 11*d*. to 1*s*. 4*d*. per gallon, and the total produce of Carniola in 1870 was nearly 5,000,000 gallons.

The awards granted for the samples sent from the province of Küstenland, which comprises the earldom of Görz, Trieste, and Istria, consisted of one medal for progress given to Count Latour of Russitz, near Cormons, and one medal for merit allotted to Herr J. Ganz, of Dornberg, honourable mention being made of the wines of four other exhibitors. Of the Görz samples those grown in the sandstone soil were very poor, and by no means palatable; others, however, were firm, and contained a considerable amount of both tannin and alcohol. From the vineyards in the plains came a remarkably disagreeable wine called Friauler, which as a matter of course was said to be a great favourite among the inhabitants of the locality. It was dark in colour and exceedingly bitter to the taste, but we were assured that after it had passed through the summer it would lose much of its present acrid flavour. Terran wine—a produce of the dreary rock-strewn Karst plateau, where the vines grow trained partly to maple trees, partly in garlands to poles, and on arbours—and which used to be a poor weak fluid, appeared to have improved considerably. Like the Friauler, it is deep in colour, but altogether milder and more palatable. The grand speciality however of Görz is its Picolit, a thick, sweet, spirituous straw wine, which acquires a peculiar flavour with great age that causes it to be highly prized in the locality. Families treasure up this wine only to produce it on fête days, and even then it is partaken of but sparingly. One was not impressed by the samples of it tasted at Vienna, for it was a mere sugary syrup, spirituous and slightly acidulated, suitable no doubt to semi-barbarous tastes, for both Turkey and Russia, to where it is imported in bottle, hold it in much esteem. The price of the ordinary Görz wines varies, for red growths from 1*s.* 3*d.* to 2*s.* 2*d.* per gallon, and for white, from 10*d.* to 1*s.* 9*d.* per gallon. The average annual produce of the district is under 3,000,000 gallons.

Neither the reddish yellow Prosecco, a straw-wine made of exceedingly ripe grapes which are left to dry on reed mats until the end of December, nor the dark red Merzaminos or Refoscos of Trieste, where, as at Görz, the Italian system of viticulture in a great measure prevails, met with any recognition at the hands of the jury. The better kinds of red wine command from 2*s.* to 2*s.* 3*d.* per gallon, the white Trieste wines and the common red vintages varying from 1*s.* 1*d.* to 1*s.* 4*d.* per gallon. The average annual yield from the Trieste vineyards is 215,000 gallons.

In Istria the so-called colonial system prevails, the colonist here giving one half, one third, or sometimes as little as one fifth of the produce to the proprietor, according to the amount of labour the former engages to perform in the vineyard. The wines were perhaps a trifle better than those of Trieste, still not deserving of distinction. The Istrian red wine, for instance, is only marketable within its first year. At the expiration of this period it loses its deep ruby colour and subsides to the tint of a common Bordeaux. It moreover acquires bouquet just at the moment it is preparing to turn either mouldy or sour. An Istrian wine that will keep beyond the following vintage is regarded as a marvel. The Refosco wines which came from Isola were bitter, like all the wines produced from this grape, still they had the reputation of keeping rather longer than the others. When making these wines the gathered grapes are suffered to lie for several days before being pressed and when this operation is over they are stirred vigorously several times a day with a stick for a fortnight, which delays fermentation and considerably deepens the colour of the wine. Some Terran wines from the west and south of the province were sweeter, more spirituous, and altogether fuller flavoured than the wine of Trieste. Far more syrupy, however, were the samples of Piantadella—a mixture of the *must* of several varieties of sweet grapes and of a dark red colour—and also of Uvaccia made from some large red grape peculiar to the district.

In Istria the vine is rarely cultivated in enclosed vineyards, but generally in rows between other crops trained to poles, trees, espaliers, arbours, in festoons, and on terraces. In northern Istria and the Quarnerno islands the planting of a new vineyard is a very expensive proceeding, as the cleft and compact rock has first to be blasted. The holes which have been opened are then filled up with earth, which men are obliged to carry up on their backs. The average annual yield from the Istrian vineyards approaches 3,000,000 gallons, and the price of the wine in the place of production varies from 8*d.* to 2*s.* 6*d.* per gallon.

Dalmatia.—The number and quality of the samples of Dalmatian wines displayed at Vienna testified to the great progress made of late years in both viticulture and vinification in this portion of the Austrian dominions. This is mainly due to the laudable activity of the Dalmatian Œnological Society in seconding the efforts of intelligent vine growers, and a medal for progress was awarded to that body in recognition of its efforts. Thirty years ago the vine was scarcely cultivated in Dalmatia, excepting on the islands and along the sea coast, but to-day it has penetrated into the interior of the country and now occupies upwards of one twentieth of the entire surface under cultivation, which is a larger proportion than is found in any other province of the empire. Both climate and soil are most favourable to the vine, but as the principal stratum is limestone, the rocky nature of the ground necessitates the utmost toil in laying out a vineyard. Soil is carried up to the hills, and in localities of any great altitude each vine is surrounded by a wall of loose stones in order to protect it from the winds. A few Croatian vines are cultivated in some parts, but the Italian varieties predominate, the long small berried and excessively sweet Maraschino being one of the widest spread. Among the other varieties one finds the Almissa muscat with its small oval rose-scented grapes, the Cerljenacer, Glavinusia, and Advocatai, with their deep black fruit, the Vugava which yields an abundance of *must,* rich in the saccharine element, and in a very limited degree the Ragusa Malvasia.

Some wines from the Vugava grape, which is principally cultivated on the isle of Brazza, proved to be of a bright golden colour with a sweet and somewhat spirituous flavour and powerful aroma; while others had a vague resemblance to Lunel Muscat. Two of these samples secured medals for merit. Brazza and the neighbouring isles of Lacroma and Lissa, also sent some powerful alcoholic Malaga-like Cerljenacer and rose-colour Zlatarizza wines, to the first-named of which three medals for merit were awarded. From the same localities we had samples of Prosecco and Trebian wines, respectively resembling sweet and acid cider, although the grapes of the former are commonly dried for more than a week on the roof of the houses, while from the isle of Blatta came some superior growths which were recognised by a medal for merit.

The best inland wines were certainly those from Zara and Sebenico. In many of the continential districts of the province it is the practice to press the grapes slightly at the vineyard and to convey the mashed berries to the vats in goatskins turned inside out, slung across mules, the natural effect of which is to communicate a remarkably rank flavour to the wine. A different system however is pursued in the vicinity of Zara and Sebenico, where baskets are provided to receive the bruised fruit. Most of the red wines were intensely dark, and samples from the so-called Modrina and Ruscivica grapes were found to be extremely sweet, while those from the Gerbic variety had on the contrary a very bitter flavour, which was in fact common to many of the red wines owing to an excess of tannin in the thick juicy stalks of the larger kind of grapes and which are habitually pressed with the fruit itself.

Some of the Zara white wines were light and thin and sufficiently agreeable, while others had the sweetness and consistency of syrup. The wine from the famous Maraschino grape had nothing in common with the well-known liqueur of the same name, numerous samples of which were exhibited, being simply an excessively thick and sweet wine with a vinous acid flavour and a perceptible bouquet. For some tolerable samples of this wine from Znim and Sti. Filippi e Giacomo a couple of medals for merit were awarded, two other medals being given to wines from Sebenico. In addition to these awards some Muscat di Rosa fram Spalato, possessing more of the delicate rose scent than the majority of these wines can pretend to, secured a medal for merit for its exhibitor.

In Dalmatia, where the so-called colonial system of letting out the vineyards also prevails, the vine is frequently cultivated among other crops, in which case it is planted in even rows; irregular planting prevailing in vineyards proper, and in the fields where mulberry and other fruit trees grow. The limestone sub-soil has ordinarily an upper coating of clay and lime, largely impregnated with iron and highly suitable to the production of first-class wines. Of late years, in Dalmatia much more attention has been paid to the various processes of vinification, and more especially with regard to ordinary table wines. Improved crushing mills and machines for stripping off the grape stalks have been partially introduced and the *must* is subjected to genuine fermentation. Still, in some districts the fruit is left in heaps in the open air for several days before being pressed, and the pressing itself is carried on in a very primitive fashion, a wooden club being frequently used to reduce the grapes to a pulp; moreover, white and purple grapes are usually pressed together. The price of Dalmatian wines varied in 1870 from 4*d.* to 1*s.* 6*d.* per gallon, the liqueur wines being sold from 1*s.* to 2*s.* the bottle. The annual produce varies exceedingly, ranging from 18,900,000 to 25,200,000 gallons.

Very little information is available with reference to the alcoholic strength of the Austrian wines. The poorer white varieties contain as little as 11, and the more powerful as much as 28 per cent. of proof spirit. Gumpoldskirchner varies between 20 and 23. The strength of the Austrian red wines ranges from 18° to 27°. The Moravian wines contain from 16° to 19°, which is moreover about the standard of the Styrian growths, Luttenberger being usually below the 19°. The Dalmatian wines are far more spirituous.

The subjoined table, compiled exclusively from official returns, gives the vineyard area and production, together with the value of the vintage in Austria for the year 1870:—

Provinces.	Vineyard area in acres.	Area partially planted with vines—in acres.	Produce in gallons.	Value.
				£
Lower Austria - -	106,214	—	20,652,023	1,338,495
Moravia - - -	86,328	—	2,601,519	186,864
Bohemia - - -	1,707	—	80,605	6,437
Vorarlberg - -	630	—	180,629	7,300
Styria - - -	86,166	—	16,953,381	692,846
German Tyrol - -	10,065	14,678	5,844,585	304,362
Italian Tyrol - -	—	48,187	3,306,898	127,138
Carinthia - - -	131	—	39,492	1,987
Carinola - - -	23,794	3,761	4,944,808	179,837
Görz - - -	14,718	87,847	2,862,841	137,080
Triest - - -	2,182	2,493	215,232	10,256
Istria - - -	—	119,648	2,877,886	151,404
Dalmatia - - -	90,757	91,242	23,642,942	292,988
Total - -	372,692	367,356	84,702,841	3,486,924

The exhibitors of Austrian wines were naturally the most numerous of all, being as many as 490, and exposing among them no less than 1,849 samples. Of these exhibitors 18 received medals for progress, 69 medals for merit, while of 163 others honourable mention was made. In addition there were two Diplomas of Honour awarded, one to the Znaim Agricultural Society, in Moravia, and another to the Imperial and Royal Agricultural Association of Styria.

THE WINES OF HUNGARY.

I.—*Tokay.*

Never before had so complete a collection of Hungarian wines been assembled together as at Vienna. All the great wine producing districts of the Magyar kingdom sent assortments of their respective growths, the Tokay Hegyalja, Arad, Ofen, Œdenburg, the Ermellék, Badacsony, Szegszárd, Somlau, Werschetz, Weisskirchen, Villány, and others being alike represented. The chief drawback of the collection was its extent, and its great fault the constant repetition of samples of the same character, and more especially of the commoner varieties. This was perhaps excusable on the part of a nation which produces considerably more wine than it consumes, and with whom the extension of its foreign markets, already comprising Great Britain, America, Germany, Russia, and the East, is of paramount importance.

Naturally, the historic wine—boasting a high antiquity, with a halo of tradition surrounding it, enjoying possibly more renown, and certainly commanding more fabulous prices than any other wine in the world,—claims our first attention. Formerly Imperial Tokay invariably figured at the banquets of kings, and was the accustomed present from Austrian Archdukes and Emperors to those they delighted to honour. It was the wine, which, at the Council of Trent, Pope Paul III. proclaimed to be worthy even of the pontifical throne, and which to secure a regular supply of, the Czars and Czarinas, so recently as a quarter of a century ago, kept a company of Russian soldiers constantly on Hungarian soil. The Tokay Hegyalja, where this renowned wine is produced, is situated between the 48th and 49th degree of northern latitude and forms the southern spur of the volcanic mountain chain which commences south of the Carpathians, and prolongs itself almost uninterruptedly to Tokay. The district is 24 square miles in extent and one-fifth of its entire area is planted with vines, terraces being constructed on many of the steeper slopes to prevent the earth from being washed away.

As all grand wines are grown contiguous to some river, so is the Tokay Hegyalja watered by the Theyss and the Bodrog. In winter the climate is cold and variable, in spring more variable still, while during both summer and autumn the weather is not only warm, but remarkably settled, which of course exercises a favourable influence upon the vintage.

Tokay is made from several kinds of grapes, the principal being the Furmint, or white Hungarian variety; next in importance is the Weissling corresponding with the Elbling of the Rhine; then comes the Linden leaved or long white Tokay grape, and the Augster or early white Malvasia. Other vines are cultivated to a limited extent, such as the Muscat, the white Geisstuten, the Bátac, and the Purcsin. For the production of Tokay it is essential that the grapes should be not merely ripe, but in a shrivelled condition, caused either by the bursting of their skins consequent upon the swelling of the berries from the autumnal rains, followed by the subsequent healing of the fissures; or else from the grapes being nipped by the night frosts, and deprived of their watery particles, which admits of their eventually becoming thoroughly dried by the combined action of the wind and sun.

In making Tokay, the perfectly dried berries, after being carefully selected, are placed in tubs, the bottoms of which are pierced with holes to admit of the juice—exuding from the mere weight of the grapes resting upon each other—dripping into a vessel placed beneath. The liquid thus collected abounds in saccharine matter, and is known as the Essenz, which after the lapse of years is remarkable for its excessive lusciousness, the richness of its bouquet, and its powerful flavour. It is commonly pretended that this Essenz ought to remain at least thirty years in the wood before it is bottled, still, out of the half score of samples exhibited at Vienna, only three had attained the prescribed age, and with it that "divine harmony of strength, richness, and aroma," which the Hungarians claim for this rare product of their soil. One of these specimen was on the high road to centenarian honours, dating back as it did to within a few years of the reign of Maria Theresa, and anterior to the Revolution which counts her courageous daughter amongst its noblest martyrs. Although all its sugar had turned to spirit, it still had the softness which one terms silken, spite, too, of its sharp and pungent flavour, which left a strong bitter after-taste that was almost disagreeable and may have been the result of a less skilful system of vinification than prevails at the present day. As for bouquet it was difficult to discover the trace of one. Its colour too was almost gone. Apart from taste, the distinguishing characteristic of Tokay, and that which gives it value as a medicinal agent, is the considerable quantity of phosphoric acid it contains, and which no other wine, excepting Malaga, has in anything approaching the same proportion. Another sample was precisely half a century old, and a third, exhibited by Count Degenfeld, was of the vintage of 1841. The particular sample however which carried off the only medal given for Tokayer essenz, was of the infantine age of five years, and was topaz tinted, sweet, sharp, and oleaginous-like, with a fine pungent flavour and perceptible bouquet.

There were a score or two of exhibitors of Tokayer ausbruch, several of whom secured medals for merit, including Count Aladár Andrassy, D. H. Wiessburg, of Erdöbénye, F. Schikedanz, of Tokay, and the wine growers' agency of Pest. Tokayer ausbruch is produced by pressing the ripe grapes from which the shrivelled berries have been already selected, and adding the *must* obtained from them to a certain quantity of dried grapes which have been previously reduced to a pulp, either by being well trodden, or by a machine. According as the wine is required to be sweet or dry, the quantity of dried grapes is added to or reduced. For a remarkably sweet wine, 30 gallons of must will be mixed with five tubs, containing 30 gallons of these dried raisins, while for a wine less sweet, four or a fewer number of tubs will be employed. Hence it is that in the mystic language of its producers Tokayer ausbruch will be described as a wine of one, two, three, four, or five tubs.

After the *must* has been added to the specified quantity of pressed grapes, the whole is left to ferment from 20 to 48 hours, according as the temperature is warm or cool, being occasionally stirred during that time. Eventually the mixture is strained through sacks by violently treading on them, after which it is poured into a cask. The refuse skins and stalks are then emptied into vats and common *must* is poured over them. After being well mixed together the whole is allowed to stand for several hours and again strained through sacks. The result is the Forditás or Wendung wine, of which samples were included in the collective exhibition of the Tokay Hegyalja, which comprised alike Essenz and Ausbruch of all ages from 1806 to 1869 and of all grades from one tub to five; Szomorodner, Muscat, Ordinär, 57 years old, Forditás, which had nearly attained half a century, and Mástás, or second wine consisting of ordinary *must* which has profited by having the lees of Imperial Tokay steeped in it—although not the rose itself, it has lived beside it. This interesting collection composed of 47 samples included, in addition to a certain number of veterans, all the grand vintages from 1861 up to the present time, and a medal for progress was unhesitatingly awarded to it.

What is termed Szomorodner is made from grapes which have not had all the ripest berries selected from them, and which after being subjected to pressure in sacks are next crushed beneath the bare brawny feet of stalwart Magyars when the *must* which has been previously expressed is poured over them. This mixture is allowed to remain for several hours until in fact it commences to ferment, and after being stirred a few times is again placed in sacks to be again vigorously trodden, when the *must* obtained from it is poured into casks, the lees serving to make Wendung wine. The quality of Szomorodner depends entirely upon the amount of dried grapes used in its preparation, and in bad seasons it not unfrequently happens that it turns out quite as good as the Ausbruch. The samples of Tokayer szomorodner were rather numerous at Vienna and singularly opposite in character, whether as regards colour, body, dryness, or flavour. The general qualities of the wine, however, are perfect softness and fulness, combined with that peculiar pungency common to every variety of Tokay. Medals for merit were given to Count Otto Szirmay and Dr. J. Szabo for samples of vintages 1866, 1868, and 1869, and to Madame Bornemisza for Hegyaljaer-Muscat made by mixing the Furmint and Muscat grapes, a wine which some connoisseurs profess to prefer to the purer vintage of Tokay. In all there were 152 samples of the different varieties of this celebrated wine, the exhibitors of which secured one medal for progress and twelve medals for merit, in addition to honourable mention being made in nine instances.

In abundant years the Tokay vintage yields 150,000 eimers equal to nearly 1,900,000 gallons; in ordinary years the yield is only half the quantity, and in bad seasons it scarcely exceeds one fourth. The superior wine forms about 15 per cent. of the entire produce, and of this about one fifth is of extra fine quality. Not merely ripe but over ripe berries are essential to a successful Tokay vintage, and a few fine days very late in autumn conduce more than anything else to this desired result. Between 1840 and 1865 there were nine such vintages including 1841, 1846, 1848, 1852, 1855, 1856, 1858, 1862, and 1863. Four years, namely, 1840, 1842, 1847, and 1851, yielded wines of very inferior quality. The vintages of the intervening years were of a medium character.

II.—*Ordinary Hungarian Wines.*

The Arad wines, coming as they do from the south, are ordinarily classed next in quality to Tokay, and among them the red Méneser ausbruch, more or less a sweet wine, takes precedence. The oldest exhibited sample was of 1837 vintage, but out of the many specimens of the famous dry red Méneser there was only one which dated back even to the year 1858, the remainder having seen merely a few summers. It was different with the white Ménesch wines, several of which counted their quarter of a century of existence while one had passed its fortieth year The Méneser ausbruch has nothing to distinguish it from the general run of sweet red wines; whereas the dry variety is unquestionably a wine of some mark. It is of a rich ruby colour, has body and is clean tasting but unmistakably astringent, and was altogether the nearest approach to the unfortified wines of Portugal of any wine in the Hungarian collection. The Magyaráter samples were chiefly from the Riesling or Bakator grape and exhibited either the freshness and the fragrance common to the one or the soft rich pleasant flavour of the other. Among the Bakator varieties a wine of the famous comet vintage carried its two and sixty years in a fashion which few wines from the Rhine could have done. Three exhibitors of these Arad wines obtained medals for merit.

Karlowitzer, when the vintage is a fine one, possesses as much character and what the French term "*feu*" without thereby meaning exactly heat, as any red wine grown on Hungarian soil. It comes even more south than Méneser, from the banks of the Danube some 40 miles or so this side of Belgrade. Like Méneser it bears a close resemblance to a natural Port, has the astringency pertaining to the growths of the Alto Douro, though in a less marked degree, and all their splendid colour, but in common with Méneser has scarcely their fruitiness, besides which it appears to be deficient in bouquet.

Some very fair red wines came from Szegszárd, on the river Sarvis, due south of Pest, and at no great distance from the Danube, one sample of which ten years old had crossed the Equator four times, and was certainly none the worse for its ocean trips. These wines were fresh and clean tasting, and not unlike the best growths of the department of the Hérault, in the south of France, having a certain thinness of body, which their decided spirituous character fails to disguise. Their colour too was a little pale. A couple of samples of Szegszárder, both of 1868 vintage, carried off medals for merit, and a white wine of Fünfkirchen in the same district was similarly rewarded. Red wines with more or less character are grown in the neighbourhood of Buda, or Ofen as the Hungarians prefer to call it. The best growths came from the Adelsberg vineyards, and those of a respectable age were mellow, spirituous, and fruity-tasting, perhaps a little thin, and having a slight bitter after-flavour, which was, however, rather agreeable. The white wines of Ofen were somewhat sharp, and had a cool fresh taste, with a pleasant though faint bouquet. A couple of samples of red Ofner had twice crossed the Equator, which appears to be the favourite test to which the Hungarians subject their wines, and were in perfect condition. Had the wines required any such guarantee these and half a score of similar examples would have placed their travelling qualities beyond a doubt. Erlau, north-east of Pest, and the neighbouring districts of Heves and Jazygieu sent specimens of their roughish red wines, for which the last-named localities obtained a joint medal for merit, and there were samples of Tétényer, dry and very deep in colour, together with Klein Tétényer from the black Burgundy grape, which excepting a slight sweetness, had a true Burgundy flavour. Archduke Albert contributed some excellent wines from the Riesling, as well as from the Burgundy grape, grown in his vineyards at Villány, south-east of Fünfkirchen, together with a considerable collection of Neusiedler lake wines, from the neighbourhood of Œdenburg, and including alike Riesling, Traminer, and Clevener, varieties vintaged between 1867 and 1870.

The white wines of Œdenburg, just across the Austrian frontier, were amply represented both as regards dry and sweet varieties, and by wine merchants as well as by growers. The dry wines, while resembling the Austrian white wines, are more delicate than the general run in their paleness and thinness, and when not made with a mixture of the Muscat grape have no pretensions whatever to bouquet. An exception, however, must be made in favour of the one grand wine which confers distinction on the district; the well-known Ruster, which when old and dry is of a pale golden hue, and has a fine full, and peculiar flavour, being often sharp, slightly sweet, and bitter at the same time. It is also highly potent, although in taste it suggests no particular alcoholic strength. The sweet variety is deeper in colour, is somewhat luscious, and has the veritable flavour and bouquet of genuine Tokay. These wines carried off three medals for merit, while the remaining Œdenburg wines obtained only one.

The Ermellék wines were best studied in the collection exhibited by Count Franz Zichy, president of the wine jury, comprising numerous samples, one or two of them dating back to the year 1827, and all grown in his extensive vineyards at Erdiószegh, in the Ermellék, near where the mountain spurs descending from Transylvania unite with the boundless Alföld plain. This vast expanse, evidently the basin of a dried-up inland sea, which in pre-historic times extended from the Carpathians to the lower Danube, is intersected by no regular system of roads, neither are there signposts to guide the stranger, who has to depend on the chance print of a horse's hoof, and not unfrequently on his own mere instinct. On the skirts of this plain rise a chain of hills—extending towards the north, and encompassing the base of the Réz Gebirge like a ring—known as the Ermellék. As far as Somlyo their slopes are gentle, and their summits generally level, both sides and plateaux being designed as it were for the cultivation of the vine. Pretty villages and market towns are scattered over the Er valley, most of the inhabitants of which are Hungarians, and even the few of Roumanian origin sprinkled among them differ chiefly in religion from the bulk of the population, being Hungarian both in dress and language.

The cultivation of the vine in the Ermellék extends over 5,800 acres, yielding annually upwards of a million and a half gallons of wine, and nearly all the labour of the district is employed upon it. One reaches the Ermellék by railway to Grosswarden, whence a carriage drawn by three fleet Hungarian horses hung with bells conveys us to Erdiószegh along that rarity a good road, which being the one used by the president of the komitat is obliged to be kept in thorough repair. After passing Püspöki and the Behar settlement, where we notice the trenches and earthworks of an old fortress, we drive through the opening to a wide valley, with the Réz Gebirge rising up in the blue distance on our right hand, while on our left stretches the boundless prospect of the Alföld plain, the very picture so to speak of freedom. Behind Félegyháza one perceives a slight eminence, to the left of which is deep open country, with a tiny stream glittering among the fields and pastures which surround the few scattered farms. It is in the midst of this pleasant looking landscape that the little town of Erdiószegh is situated.

Count Franz Zichy, who is bent upon introducing a proper system of vine culture into the Ermellék, has converted his Erdiószegh vineyards into a kind of nursery, presided over by experienced Rhenish vine-dressers, for experimenting on the different methods of treating both native and foreign varieties of the vine. Besides planting a couple of rows each of numerous species, and treating them all after an uniform fashion, he has had his vineyards divided into distinct sections, where one or other choice kind of grape is cultivated. The vines instead of being huddled close together in the prevailing Hungarian fashion, are planted upwards of a yard apart, and cultivated in every respect according to recognised scientific principles. At the vintage too, instead of following the common practice of putting the grapes into sacks and treading them in a tub, and then leaving the *must* to ferment in open casks, which have been previously sulphured, Count Zichy has introduced improved presses and crushing mills and constructed fermenting chambers. The commoner grapes are not separated from their stalks, but the choicer kinds are, and after being crushed the *must* is left on the skins until fermentation ensues, which, carried on in large fermenting chambers, provided with heating apparatus, ordinarily lasts for eight days, the after fermentation continuing from one to two months longer. The *must* of the common wines ferments in casks properly closed and provided with fermenting pipes. Subsequently all the wines are "matured" by being heated up to 130° Fahrenheit according to Pasteur's system, after which they are left to repose for a year.

Count Zichy's wines were all admirably made, and in excellent condition; indeed there were no sounder wines in the entire Hungarian collection. They were, moreover, fresh and clean tasting, and several were deficient neither in softness nor bouquet, still as a rule they seemed generally to lack specific character. They conveyed the impression of being rounded off to an uniform standard, so that their merits were rather of a negative kind. No objection could fairly be taken to a single sample, yet none called for exceptional commendation. In a word they were admirable ordinary wines and nothing more. This in a measure was accounted for when one learned that it was the practice on the Count's estate invariably to mix the *musts* of different vineyards, and frequently those of different years even, the object being always to offer for sale a wine as nearly as possible of uniform quality. The sound character of the Count's wines was evidenced by the fact that he exports them even to Japan, where they arrive in a satisfactory condition.

There are several other Hungarian white wines of mark requiring mention, notably Somlauer, from the Somlau mountain, in Veszprim county, south-east of Œdenburg, also

Badacsonyer, grown in the same district, on the mountain slopes bordering the Plattensee, and Nesmélyer. The samples of the first well-known wine were rather numerous, and generally good. Indeed, as a rule, Somlauer is a wine of very even quality. One specimen—a so-called dessert variety, fifty years old—and a couple of others of the vintage of 1834, showed its keeping powers to good advantage. Still, it was best represented by younger growths, partly because of late years the Hungarian wines have been better made than they were a quarter of a century ago, but chiefly because no wine worth anything will keep half a century and be improved thereby. Connoisseurs pretend to admire the almost nauseous bitter flavour often acquired by very old Tokay simply because it is *de rigueur*, and not because they really believe the wine improved by it. Of the score or more of centenarian and semi-centenarian wines which I had the opportunity of tasting at Vienna, there was not one that would not have been superior on its twentieth birthday. On the whole, perhaps, the Madeiras carried their weight of years best of all, but this was owing to the amount of adventitious spirit which at one time or another had been administered to them. While on the subject of old wines, I may incidentally mention that the most antiquated sample in the Hungarian collection was a Keszthely-Tomajer of 1796. The Somlauer which secured the medal was a comparative juvenile, of vintage 1863, and its exhibitor was Count Erdödy of Doba. In taste it was very like a fine Chablis, not even the congenite *pierre à fusil* flavour being wanting.

There were several collections of Badacsonyer, showing the wine at its best, one of the older samples, as was the case with scores of other wines, being of the famous comet vintage of 1811. It was, however, in the specimens from the cellars of the Bishop of Veszprim that this wine was to be studied to most advantage. In these it was presented sweet and dry, and in the Essenz and Ausbruch forms, and from the Furmint, Muscat, Picolit, and other grapes. A medal for progress was of course assigned to the Bishop, who also exhibited some fine Somlauer of 1857 vintage, just the very age to be sufficiently matured, and at the same time to have preserved all its vinous qualities. The ordinary samples of Badacsonyer rank merely with third class Rhine wines. The specimens of Nesmélyer were very few, and of these the majority were exceedingly acidulous, while the one or two of superior quality had the flinty flavour, prevalent in most of the common white wines, very decidedly developed.

The Pressburg wines, as a rule, were of a very ordinary character, excepting, of course, the white St. Georger.

Certain other white varieties were delicate and pleasant, more especially one from the Riesling grape, which secured a medal for merit. Werschetz, situated south of Temesvar, and in the Servian Woiwodeship and Banat, and claiming to be the largest wine-producing district in the Austrian dominions, its vineyards yielding in favourable seasons upwards of twelve millions of gallons of wine, sent several scores of samples of its highly spirituous, but not otherwise remarkable growths. The mildest were the white wines made from the red Steinschiller, or "little fleshy grape," as it is termed in Werschetzer vernacular. Some red varieties of a fine ruby colour, and, what is most unusual, with a pleasant bouquet, were from the Kadárka, or so-called "noble blue Hungarian grape," which requires the full heat of a Hungarian summer to attain perfect ripeness, and excepting the Furmint, is the only grape the berries of which will attain the requisite degree of dryness on the vine suitable for Ausbruch wines. Weisskirchen, which lies still more to the south, and about ten miles from the Danube below Belgrade, sent wines very similar in character, more than half being from the favourite Steinschiller or the Kadárka grape, and comprising among them numerous Ausstich wines.

Most of the wine-producing districts of Hungary contributed samples of Muscats, and many of their other growths had evidently been flavoured with this grape, which appears to be regarded with considerable favour, possibly by reason of its perfume which is the one essential in which Hungarian wines are ordinarily deficient. A few of the principal districts also sent samples of Vermuth which is a Hungarian as well as an Italian speciality, made however by steeping spices and wormwood in fine old wine, which is then held to possess peculiar medicinal virtues.

The Croatian and Slavonian wines formed a group by themselves, their exhibitors determining that they should neither form part of the Austrian collection nor yet be included among the wines of Hungary. There were eighty samples and the catalogue was rather liberal in its commendations of Croat and Slavok wine growers who were described of energetic and inquiring dispositions, and as making their wines on rational and intelligent principles. Since the exhibition of Croatian wines at Agram in 1864, when nearly all the white varieties, excepting such as were purely sweet, were condemned by Baron von Babo in his report to the Austrian Government as being either so much vinegar or having a disagreeable musty flavour, the Croatians must have greatly improved their system of vinification or been more careful in their selection of samples, for many of the wines sent to Vienna had considerable merit of their kind. Some red wines made from the blue Cinamon or red Portuguese grape were almost equal to the Hungarian, notably the samples of Vukovárer of 1862 and 1868, for which and for a Riesling auslesse Count Carl Eltz obtained a medal for progress, and the Belec wine of Baron Rukavina for which a medal for merit was given. These wines were intensely deep in colour, and more or less fine in flavour, but were deficient, like nearly all southern wines are in bouquet. A medal for merit was also given to Prince Odescalchi for some well preserved samples of Syrmier and Sliwowitz white wines and several exhibitors of Schillerwein, or wine of half colour arising from red and white grapes being pressed at the same time, had honourable mention made of them, one for a sample of the vintage of 1839 which showed plainly enough that Croatian wines when properly made will keep for 33 years without becoming either musty or sour.

The white wines were either very sweet and marrowy or very thin and sour, many of the latter having much of the sharpness of an unripe apple. This arose from the species of grape employed, the large berries of which ripen very late but are gathered before the proper time. The thinness of these wines is attributable to the same cause, the amount of water which the grapes contain not having been reduced by evaporation. As a further consequence the wines contain only a small quantity of alcohol.

The Hungarian wines, though sufficiently generous, are by no means of a highly spirituous character. Tokay, for instance, only contains from 20 to 25 per cent. of proof spirit, Ruster not more than 20, Bakator about 22, Somlauer from 22 to 24, and Nesméleyer only 21. With regard to the red varieties, Méneser averages from 23 to 24, although at times it contains as much as 28 per cent., Karlowitzer ordinarily indicates from 24° to 25°, Erlauer about 24°, Szegsárder scarcely more than 20, and Ofner rather less, indicating, as it freqeently does, no more than 18° of proof spirit. The practice of heating young wines up to a temperature of 130° Fahrenheit, according to the system of M. Pasteur, prevails to a considerable extent in Hungary, where it is carried out on a large scale and with complete success, the result being the maturing of ordinary wines, without their having to rest three or four years in the wood.

III.—*The Wines of Transylvania.*

The collection of Transylvanian wines differed from every other. It was select and had been judiciously limited, still it included samples of the commonest as well as the best varieties, and indicated in fact precisely what an exhibition of wines really should be. From the 118 samples contributed exclusively by the landed proprietors of the province a far better idea was procured of the wines of Transylvania than was gained of those of Hungary from more than ten times that number, with all the less interesting growths repeated *ad infinitum*, drowning as it were the more remarkable varieties. In the one instance the wines were tasted with satisfaction and judged with care; in the other the tasting was found so irksome, and apparently interminable, that much of it was left to paid experts. Exception was of course made with the choice collections from Tokay and all the other higher class growths, but the jury generally felt nothing was to be gained by devoting day after day to hundreds of crude and inferior wines all with a strong family resemblance and the common place character of which was perceptible the moment the glass was raised to the lips.

The three most important exhibitors in the Transylvanian section were Count Emerich Mikó, the Transylanian Wine Company of Klausenberg, and Mr. John Paget, an English gentleman settled for many years past in Transylvania, and author of a well-known book of travels in Hungary. Count Mikó exhibited seven samples of the ordinary table wine of the district grown in one or other of his various vineyards, of which the first from Oláh Szilvás and 46 years old testified to the keeping powers of the commoner wines of Transylvania. There was a second *tischwein* in its fortieth year, with a Tasnáder Bakator of the same vintage, the latter, a fine dry pale colour wine, surpassed however both in flavour and vinosity by one of the year 1848, which analysis had shown to contain 25 per cent. of proof spirit. These admirable wines derive their name from the species of grape whence they are produced, namely the famous *bacca d'oro*, imported into Transylvania from Italy centuries since. The count's collection comprised in addition some rich Ausbruchen, the *must* of which had flowed without pressure from the fully ripened grapes, with a wine made from the Furmint, the dominant grape as already mentioned in the Tokay Hegyalja. For the fine character of these and other samples Count Mikó was awarded a medal for progress.

The Transylvanian Wine Company's collection was principally remarkable, first for its Rózsamáler ausbruch of 1834, grown in the vineyards of the Bishop of Karlsburg, a magnificent wine of remarkably high flavour and with a slight bouquet, priced at 3*s*. 8*d*. the bottle; next for its series of

Kokelbürger, clear golden tinted wines not in the least degree sweet, and yet not precisely dry, with more body than the average growths of the Rhine and occasionally exhaling a pleasant aroma. These wines ranged from 1*s.* 6*d.* to 3*s.* per bottle according to age. Indeed, 3*s.* per bottle seemed to be the average price for wines of the highest class, and 10*d.* per bottle for ordinary table wines. These are of course the prices at Klausenberg and include the expense of bottling. The collection further included samples of Bakator and Riesling and wines from the Furmint and Clevener grapes; also a remarkably fine wine known as Som, or Sombor, not to be confounded with the Hungarian Somlauer, to which it is immensely superior. The best sample of this particular wine was forwarded by Herr von Gerendi, and was exquisitely soft and refined in flavour, of a tender straw colour, clear as crystal, and with a delicate bouquet. Altogether it was one of the most beautiful wines in the Transylvanian section and secured a medal for merit for its exhibitor. The samples contributed by Mr. Paget from his Szökefalva vineyards comprised Leánykas and Rieslings, including a Welsch Riesling of 1869, which had been heated according to Pasteur's principle and had acquired all the characteristics of a fully matured wine; also a Muscat Croquant of 1866, dry and delicate and with ample bouquet. The Muscats by the way were equally prevalent in the Transylvanian as in the Hungarian section. Among the other wines were Máslás, light and clean tasting; Traminer equal to the best growths of the Palatinate; a still white wine of considerable flavour and delicacy from the Champagne grape; a Sauternes that might have come from the Ciron valley in the Gironde, and beyond all a red wine of 1868, from the Cabernet grape, which rivalled some of the best growths of the Haut Médoc; possessing brilliant colour, bouquet, and *finesse,* combined with a trifle extra force, showing in fact 22 degrees of proof spirit, and which may be pronounced the finest red wine without exception which either Hungary or Transylvania have yet produced. The three last-named wines were all experiments on the part of Mr. Paget, who was warmly congratulated on the highly successful results which had attended his efforts.

For some samples of Tófalver Riesling of 1868 and 1869, exhibiting unusual softness and delicacy, a medal for merit was awarded to Baron Karl Apor, and the same medal was allotted to Count Banffy for some fine Tasnáder of 1863, to Count Bethlen for his Tasnáder Bakator, to F. von Földváry for some excellent Törökhegy, to Baron Kemény, a perfect enthusiast in favour of the Riesling grape, for the single sample exposed by him of his Csomborder Riesling, and to L. von Sámi for his Szödemeter Bakator of the year 1862. Of ten other exhibitors honourable mention was made. Besides the admirable wine exposed by Mr. Paget, the aggregate collection comprised merely a couple of other samples of red wines, neither of which were of a character calling for special notice. Red wines, indeed, are extremely rare in Transylvania and invariably of inferior quality, hence the importance of Mr. Paget's successful experiment with the Médoc grape.

As the Transylvanian rivers nearly all flow westward the hills naturally lie in the same direction, having one slope exposed to the vertical rays of the noonday sun, and consequently furnishing admirable sites for the cultivation of the vine. The best wines are grown, first, along the banks of the Little Kokel river, the vineyards of which produce strong, clear, aromatic wines, containing little or no tartaric acid; next, in the neighbourhood of Karlsburg, the wines of which are alcoholic, spirituous, sub-acidulous, and of a rich golden tinge; also near the Great Kokel, where they are lighter in colour and less spirituous; and in the Hunyad and Upper Maros valleys, yielding wines that are at once powerful and deep-tinted; finally at Nyárád, near Maros Vársáhely, and in theMezöség, the wines of which are light and agreeable, those of the last-named locality also exhibiting a more decided bouquet than any of the other growths. The most extensive viticultural districts of Transylvania are those of Hermannstadt, Czilágy-Somlyó, Karlsburg, and Maros-Vársáhely, and the ordinary soil is sand and marl, more or less mixed with stony debris and shelly limestone. The average yield is at the rate of about 200 gallons per acre.

Transylvanian wines ought never to be drunk until their fourth year. Their alcoholic strength varies materially, according as the season has been favourable or otherwise. In good years they show 21 degrees of proof spirit, and in special instances as many as 27 degrees.

This notice of the wines of Transylvania may be advantageously supplemented by a few extracts from a communication with which Mr. Paget has recently favoured me. He writes: "I attribute the superiority of the Transylvanian white wines, which is now generally acknowledged by the Hungarians themselves, chiefly to climate and to our mode of cultivation. In Hungary the vines are, for the most part, pressed very close together in the rows, the rows themselves being scarcely more than a foot and a half to two feet apart; whereas, in Transylvania the vines are planted at intervals of fully three feet, with the rows at the same distance from each other. The Hungarians, moreover, keep the vine stumps reduced to six inches in height, leaving only that limited space for the bearing wood to proceed from. In Transylvania, where the long cut is adopted, the jucies pass along a much greater extent of wood, and are probably better eliminated before they arrive at the fruit. With the Hungarian system the produce is greater but the quality suffers. The climate of Hungary is, moreover, warmer, and although a hot climate yields a strong spirituous wine it rarely produces one with great delicacy and bouquet. The month of October too is singularly fine in Transylvania, which is important as it enables us to delay our vintage until the end of that month, or even till November. Another advantage arises from the landed proprietors of Transylvania attending more to the management of their estates and to their cultivating the vine, not alone for profit but for the love of the thing, causing them to spare neither expense nor personal attention to bring it to perfection.

"Until within the last fifteen years only the same descriptions of vines were cultivated as had been planted when the vine was first introduced into Transylvania. Since then, however, the vines of the Rhine, and especially the Riesling, the Welsch Riesling, and the Traminer, have been imported, and the plantations of them are now considerable. I was the first to introduce French vines. Hitherto Transylvania has had no red wines, and it was supposed red wines could not be produced. I, however, obtained from France through the assistance of Dr. Guyot cuttings of the best vines of the Gironde, which I planted in 1865, and three years afterwards produced about four pipes of the wine you so much admired at Vienna. As far as I can judge it has all the finer qualities of the best Bordeaux, with more strength. Like every other Transylvanian wine in the Exhibition it was free from the addition of spirit, or, indeed, of anything else beyond the pure juice of the grape. The Sauvignon and Semillon, the Sauternes vines, are less hardy, but promise equally well so far as the quality of their produce is concerned. I have hitherto hesitated to recommend the cultivation of French vines, but the opinion of so many competent judges has removed any scruples I may have had, and now many others will plant them. I made a trial of the red and white Burgundy species and also of the Champagne, but although the quality of the wine was good the yield was very small. I suspect my vineyards are too warm for these vines, for they ripen there in September, whereas the Bordeaux grapes remain on the vines with the leaves green until the end of October.

"Formerly the management of our wines in the cellar was most miserable, and ten years ago there was not a man in Transylvania who knew how to prepare a cask of wine for bottling. In 1864 some 20 of the principal wine growers formed a society, and their first step was to bring a cellarman from the Rhine, in fact, from Johannisberg itself, and to place the management of their private cellars and soon afterwards of a common cellar in his hands. This continued for some years until the demand for our wines became so great that in 1870 we were obliged to form a company, and at the present time the home consumption is such that owing to the small yield of recent years our stock is well nigh exhausted. A considerable portion of the wines sent to the Exhibition was from private cellars, the fact being that we presented ourselves at Vienna to show more what we could produce than what we actually had to sell."

The published agricultural statistics of the kingdom of Hungary give the following as an approximate estimate of the vineyard area in the respective provinces :—

	Acres.
Hungary - -	719,320
Transylvania -	66,839
Croatia and Slavonia	79,640
The military frontier with the Servian Woiwodeship and Banat - -	71,107
	936,906, producing 221,214,400 galls.

The exports of wine from Hungary during the year 1867 were 22,000,000 gallons, valued at 880,000*l.* In 1869 they amounted to nearly 40,000,000 gallons, the value of which was nearly a million and a half sterling.

The total number of exhibitors of wine from the kingdom of Hungary was 253, and they contributed no less than 1,514 samples. The rewards allotted to them comprised a Diploma of Honour to the Agricultural Society of Klausenburg, seven medals for progress, and 50 medals for merit, in addition to which 76 exhibitors had honourable mention made of their samples.

THE WINES OF RUSSIA.

The wines of Russia were represented at Vienna in accordance with the principle pursued with regard to her other products, natural and manufactured, that is, not by a bewildering multitude of samples, but by a judicious selection of typical varieties from the different wine producing districts. In Russia the vine is cultivated over a considerable surface of the entire southern portion of the empire, which having regard to the character of the wines may be divided into four principal regions, namely, Bessarabia with the adjacent provinces of Cherson and Podolia, the government of Taurida which includes the Crimea, the valley of the Don, and the Caucasus. Wine is further produced on the banks of the Volga near Astrakan and Kislar, and also in Turkestan. The most northern limits of cultivation are Zymliansk on the Don and Kamena in Podolia within the 48th degree of north latitude. According to official calculations, which are believed however to be in excess of the actual facts, the total annual yield in imperial gallons is for Bessarabia 8,100,000, Cherson 1,026,000, Crimea 3,240,000, the banks of the Don 405,000, North Caucasus 8,910,000, and South Caucasus 22,680,000. From the remaining districts no returns have been published.

At Vienna the growths of the Crimea were principally represented by the collection of Prince Woronzoff from Yalta, of Senator Fundukley from Gursuf, of MM. Lansky and Wissman from the Soudack valley, and of the Margaratsch school of vine culture; those of the Caucasus by the collections of the Princes Andronikoff and Eristoff of Tiflis, and Prince Tschawerzawdse of Kuchetieu. From Newe Tscherkask on the banks of the Don, and Kischinoff on those of the Pruth, came samples of the wines of the country of the Don Cossacks and of Bessarabia, while Odessa supplied specimens from the government of Cherson, and Astrakan examples from the Volga.

Prince Woronzoff, who is the owner of numerous vineyards on the south coast of the Crimea at Alupka, Aydanil, Aydosmos, and Massandra, and with whom the cultivation of the grape with a view to wine is the object of particular attention, sent samples of both red and white wines produced from the Bordeaux, Sauternes, Riesling, Furmint, and dry and sweet Muscat grapes. Of the foregoing the *vins de dessert* were unquestionably the best. The samples from Senator Fundukley, M. Wissman, and the Government vineyard school were from the same varieties, excepting that some so called Burgundies from the Pineau noir were included. The white wines, which were greatly in the majority, were with very few exceptions remarkably good. Some were rather rich and captious; others more delicate, and especially several from the Riesling grape. They had however more roundness and substance and less acidity than the ordinary Rhine growths, with a fine full flavour and so much individual character and *finesse* as to challenge comparison with some of the best wines exhibited. One sample especially, contributed by M. Wissman, was distinguished by its choice bouquet. Generally speaking it was exactly the reverse with the red wines, which with certain occasional exceptions, notably some samples from M. Lansky, were very inferior in quality, the majority having a decided *goût de terroir*, while those assuming to vie with the higher class Burgundy and Medoc growths proved to be very feeble attempts indeed in this unquestionably difficult direction.

On the other hand some of the red wines of the Caucasus —contributed by the trio of princes already enumerated, and some half a dozen other exhibitors, and among which was included the Kachetan wine, the praises of which have been often sung by the Persian poets—were really remarkable for their refined flavour, their great *finesse*, and highly developed bouquet, whereas the white wines could only be classed among the poorest tasted. The Bessarabian samples were simply described as table wines, and so regarded were good enough of their kind. The few from the Don were of an average character, and some red and white sparkling varieties exhibited by M. Serbinoff of Tscherkash near the mouth of this river were considered deserving of honourable mention. The Crimean wines however carried off the larger share of rewards, the imperial establishment receiving a Diploma of Honour, while a medal for progress was given to M. Lansky for his excellent growths, and seven medals for merit were distributed among other exhibitors, including Prince Woronzoff and M. Wissman.

The climate of the Crimea varies considerably. The southern region is protected from cold winds by the Yaila mountains, and its high temperature and lias schist subsoil has a marked influence upon the character of the wines there produced, and which assimilate in a measure to those of southern Europe. In other parts of the peninsula the vines are planted in a rich alluvial soil, the yield in the Soudack valley being very great from the system pursued of laying the vineyards under water twice every year. The gain in quantity however is counterbalanced by largely depreciated quality; still the wines are of a good average character, and being less spirituous than the others are better adapted to ordinary consumption.

The vineyards of the Crimea are remarkable for the immense number of varieties of vine cultivated in them. Indeed almost every known species, including Asiatic and American growths, may be found scattered through the province. Those who had to do with the original planting and acclimatizing of them do not appear to have studied which kind of vines were best suited to the climate and soil of the district, and subsequent comers have not abandoned the unfruitful ones for those likely to yield an abundant vintage. The consequence is that the Crimean vineyards present the aspect of experimental fields planted without arrangement and in a fashion by no means calculated to enrich their owners. The new wine growers who settle in the Crimea follow in the beaten track and lose both time and money by so doing. Although the nature and object of the Government vineyard school at Magaratsch does not admit of limiting the classes of vines cultivated to any precise number, it would still be desirable for its conductors to concentrate their efforts on those varieties which are best adapted to Crimean growth.

Until the year 1868 wine was made in the school from all kinds of grape, but at that epoch the direction recognising the sterility of many of its experiments, and desirous more especially of favouring commerce, resolved to make fewer kinds of wine but at the same time to make considerably more wine. The expectations that were formed were not realised, however, owing to the old vineyards being suffered to remain in all their disorder and confusion, and, as a consequence, to the *must* of so many various kinds of grape being mingled together to form one wine. It was decided therefore that the vineyards should be replanted more systematically.

This mingling of varieties necessarily exercises considerable influence on the nature of the product. The wines termed Pinot blanc and Franc-Pinot, or Pineau—in other words white and red Burgundies—were made of no less than 16 and 13 different kinds of grape, including even the Oporto blanc and the Muscat noir, while that known as Bordeaux was composed of eight varieties. As every year the respective proportions varied greatly it was a matter of impossibility to produce a wine with a known distinctive character. Among other experiments made at the school were the weighing of the produce from different kinds of vine and examining the quality of their respective musts.

These furnished some curious results deserving of being placed on record here. The weights as given below showed that the quantity of berries yielded by a thousand vines of each species varied exceedingly. For instance, Muscat noir gave 1,148 lbs., Sapperavy (a red variety from the Caucasus) 1,027 lbs., Muscat blanc 1,025 lbs., Pinot blanc 1,010 lbs., Madeira 894 lbs., Muscat rose 889 lbs., Albillo castilar 835 lbs., Oporto blanc 724 lbs., Pinot gris 513 lbs., Riesling 506 lbs., Traminer 461 lbs., Bordeaux 452 lbs. The saccharine element was found to exist in the following proportions:—Red grapes, Sapperavy 29·4 per cent., Bordeaux 26·5, Pinot noir 24·53, Plant doré 24, Malbec 17·6. White grapes—Sauternes 39 per cent., Oporto blanc 37·8, Pinot blanc 34, Riesling 27, Madeira 26·5, Traminer 24·5, Albillo castilar 18·2. The sweet grapes gave the following results:—Muscat rose 42·4 per cent., Muscat noir 27·6, Pinot gris 26·5, Muscat blanc 24.

From the foregoing it will be seen how exceedingly rich the Crimean musts are in sugar, only two out of 16 varieties yielding less than 20 per cent. The quantity of acid was ordinarily from four to six per cent., although the Riesling must showed nearly seven, the white Muscat more than seven, and the Malbec as much as 9·15. Of all the examined red varieties the Caucasus grape, the Sapperavy, passed most successfully through the test. It occupies the second place on the list as regards the quantity of fruit produced, and the first place with reference to the amount of the saccharine element, which exists, moreover, in due proportion to the acid it contains. The wine is said to be much less spirituous than the foregoing constituents would lead one to suppose, while its colour is so dense that dyers are in the habit of making use of the juice. The experiments further showed that of the white varieties, the Pinot blanc was one of the most advantageous to cultivate, that the Bordeaux and Riesling grapes yielded the smallest quantity of wine, and, what is certainly an unfortunate drawback, that most of the wines were too sweet to form agreeable table wines.

Numerous analyses of Russian wines made at the Imperial vineyard school of Margaratsch give the following as their alcoholic strength in degrees of proof spirit. With respect to those of the Crimea, the red wines of the south coast range from 18¾ to 27, the white varieties commencing as low as 16—though 18 appeared to be the average strength of the weaker kinds—and going up to 28½, and the dessert wines to 29. The red wines of the Soudack valley ranged from 18 to 21, an exceptional Burgundy showing, however, 24½ degrees, while the white varied from 17 to 25½, and the Muscats indicated 28. The Bessarabian red wines ranged from 14⅛ to 23, the white from 14⅜ to 21¾, and the red wines of the Don from 19 to 25¾, the sparkling varieties averaging 15½. Of the Caucasus red wines, the least spirituous showed merely 13½, the more generous indicating 26, while the white wines ranged from 18¾ to 25.

A friend who has an intimate knowledge of Russia informs me that although good specimens of Crimean wines may every now and then find their way to International Exhibitions, it is certain that Russian wines are not esteemed by the Russians themselves, while outside Russia they are absolutely unknown. The Donski Champagne or effervescing wine of the Don and the Krimski Champagne or effervescing wine of the Crimea are both quoted in the wine lists of the St. Petersburg and Moscow restaurants, and are frequently offered in lieu of genuine champagne at private entertainments. Without being equal to the best or second best growths of the Marne they are superior to much of the Champagne sold to travellers at the hotels of Rheims, Chalons, and Epernay. In Russia it is the fashion to speak of them contemptuously almost as one speaks of gooseberry champagne in England, but the Champagnes of the Don and the Crimea are genuine wines, and though somewhat sweet may be drunk with satisfaction and in moderate quantities with impunity. It has been alleged against the Russian wines as a proof of their essential inferiority that it is difficult to get rid of them, except as effervescing beverages. On the other hand it is pointed out that the wines of southern Russia, have not yet had a fair chance, that the climate, soil, and many of the varieties of grape cultivated, above all in the Crimea, are excellent, but that what is required to make it a successful wine growing region are the co-operation and superintendence of a certain number of experienced men from the vineyards of France and Germany.

At Vienna there were 28 exhibitors of the wines of Russia, contributing among them 109 samples. The awards comprised a Diploma of Honour, a medal for progress, seven medals for merit, and honourable mention in four instances.

THE WINES OF PORTUGAL.

I.—*The Wines of the Douro.*

The wines of Portugal and Spain were both tasted in one of the galleries of the Western Agricultural Hall, sheltered it is true from a burning sun, but with the temperature far too close and heated for wine of any description to be exposed to its influence with impunity. The alcoholic strength, however, natural and acquired, of the wines of the Peninsula enabled the majority of them to undergo the ordeal. Some had certainly suffered either from the journey or the heat, and several of the lighter wines which had not turned sour had acquired a confirmed bitter flavour through the latter circumstance.

I anticipated, thoughtlessly enough, when assisting at the tasting of the wines of Portugal, that merely its natural wines would have been submitted to the jury, and that we should find the highly alcoholized fluid consumed in England under the name of Port unrepresented at Vienna. I was, however, speedily undeceived, and while engaged in studying some occasional samples of the fresh exhilarating natural wines of the Tagus and the Douro, was continually having my attention directed by the Portuguese Commissioner to certain powerfully fortified and comparatively new wines which with the view of securing my admiration for them he would approvingly inform me were Ports of the particular character appreciated by my fellow countrymen. Unfortunately Port as we know it in England is at its best a dull heady wine, depth of colour and a certain fullness and roundness being its principal merits. For its bouquet in lieu of the fragrance of fruit or flowers has too often an odour of ardent spirits, while its warmest admirers would never claim for it either raciness or freshness of taste. It is moreover especially deficient in *finesse*, is altogether lacking those subtle gradations and that refined harmony of flavour, that combined freshness and softness, which distinguish the grand *crûs* of the Haut Médoc; added to which, unlike those unique wines, it leaves neither the head cool, nor the tongue fresh.

The newer Douro wines were from time to time agreeably varied by some venerable samples of the historical grand vintages. For instance Doña A. A. Ferreira, of Villa Nova de Gaia, sent Ports of the years 1815, 1820, 1834, 1840, and 1847, the majority of which had preserved their colour, while all retained abundant vinosity, but whether this was not exclusively due to added alcohol was more than doubtful. The 1840 wine, untamed by keeping, even after a lapse of 33 years, was still unpleasantly "hot i' the mouth," conveying the impression of its having been largely fortified in the days of its youth. No price was put upon the 1815 wine, but the vintages of 1820, '34, '40, and '47, were quoted respectively at the moderate rate of 20, 18, 15, and 12 francs the bottle. Merely honourable mention was made of this collection on account of the quantity of adventitious spirit which the wines were believed to contain. The same scant meed of recognition, and for a similar reason, was accorded to Senhor J. Pessenha, of Villa Real, and to Moura and Co. of Oporto for their sets of samples comprising the best vintages from 1815 to 1858, and all from within the charmed circle on the Alto Douro beyond which it was pretended for the best part of a century that fine wine could not be produced.

On the other hand the Company for the cultivation of the vineyards of the Alto Douro and Almeida Brothers of Oporto had medals for progress assigned to them for their collections of wines, while for samples of port of the years 1830 and 1836 Doña E. C. Da Viega received a medal for merit. Similar medals were likewise given to Senhor C. F. à d'Almeida of Villa Real, to Weisse Dahl and Co., and to Senhor A. A. Silva, both of Oporto, and the last named a gold medallist at the Exhibition there. These wines were beautifully limpid, slightly astringent, and occasionally sweet. Now and then sweetness was combined with a slight sharpness and a quinquina-like flavour and perfume. One or two white varieties were amber-coloured, spirituous, more or less sweet, and sub-acidulous.

There was a fair representation of the general wines of the Douro, certain of them being deep in colour, soft, generous, and full-bodied, and altogether round, dry, clean tasting and aromatic, while others, thin, astringent, and less spirituous, had a marked acidulous freshness of flavour. Senhor J. M. Sampaio contributed some samples of these wines and obtained a medal for merit, Senhor L. F. Mourão, who had received a gold medal at Paris, being accorded only honourable mention at Vienna for the specimens exhibited by him, while the Count de Villa Pouca, a medallist of various local exhibitions, failed to obtain even this amount of recognition.

Half a score of exhibitors from Penafiel in the Oporto district contributed samples of last year's wines, the white varieties generally thin and light, while the red were a little harsh and rough, and altogether less full and fruity than the Douro wines ordinarily are, yet fine in colour and of considerable alcoholic strength, due in some degree to the adventitious spirit administered, to enable them to travel. Many of these wines, the *vinhos de mesa*, or table wines of the district, and in which a decided flavour of Port is discernible, command on the spot no more than 4*l.* per pipe. Honourable mention was made of merely a single Penafiel exhibitor, and this for a sample of red wine of 1868 vintage.

There were several samples of Geropiga, a kind of liqueur with a certain affinity to the Spanish Dulce and the French

Rogomme, and, as is well known, much in request for giving character to low class Ports, besides being exported in considerable quantities to America. When of good quality it is composed of two-thirds or more of unfermented grape juice, and one-third or less of brandy overproof distilled from Port wine. In some varieties of Geropiga the grape juice undergoes a partial fermentation which is checked at its height by the addition of spirit. But, however made, it is commonly deepened in colour with elderberry extract after which it is highly sweetened with sugar. This liqueur, for such it really is, costs on the spot about double the price of good average Port wine. There were both red and white varieties exhibited, some of the samples being very old and soft, whereas all were excessively sweet and more or less spirituous.

The Douro region, producing the finest wines, comprises the slopes of the mountains bordering the river of the same name in its course from the Spanish frontier to the province of Minho, and it is on the hilly banks of a tributary stream, named the Corgo, that the Port wine vineyards—the soil of which is extremely stony, due to the friability of the slaty schist rock of which the hills are formed—are principally situated. The vine is cultivated over an area of 76,314 acres, and the principal varieties of grape are the Alvarelhão, the Bastardo or Morillon, the Touriga, the Gouveio, and the Souzão, the latter yielding a wine deficient in bouquet and flavour, but extremely deep in colour. The Douro region is estimated to yield altogether rather more than 11,000,000 gallons of wine annually. Official returns give the produce of the Villa Real district, which is understood to comprise all the finest vineyards, at 62,942 pipes, which would be equivalent simply to 7,238,330 gallons. Of these 6,067,526 gallons were exported. The estimated value *in loco* of new Villa Real wine, so recently as 1866, ranged from as low as 15,000 reis, equal to 3*l* 6*s*. 6*d*., to 40,000 reis, or merely 8*l*. 18*s*. per pipe of 115 gallons for the finest growths, being a trifle over 1*s*. 6*d*. per gallon. On the other hand, the Portuguese official returns for 1870 estimate the average value of the Port wine exported to England in that year at 6*s*. 9*d*. per gallon.

Since 1840 there appears to have been a larger number of fine vintages on the Alto Douro than in any other district producing first-class wines, as shown by the subjoined classification:—Very good, 1840, '47, '51, '53, '58, '60, and '63. Good, 1842, '44, '46, '48, '50, '52, '54, '61, '62, and '65. Bad, 1841, '45, '55, '56, '57, '59, and '66. In 1872 the imports of Port wine into Great Britain were 4,018,113 gallons, exhibiting an increase of no less than 36 per cent.

within the short space of four years. In the same year the consumption amounted to 3,297,777 gallons, being 100,000 gallons in excess of that for the year 1871.

Judging from the numerous samples of the higher class Ports of recent vintages which came under the notice of the Vienna jury, and to which I paid especial attention, I am convinced the fortifying of these wines is carried on to the same extent as formerly, partly possibly because it is a kind of tradition with the growers and shippers that a high spirituous quality is looked for in Ports by foreigners generally, partly to disguise the extreme roughness of the inferior vintages, but mainly to make up for a clumsy mode of vinification, and to render the wine quickly marketable. If alcohol were not added the wine would have to be kept for two or three years before it could be shipped with safety, instead of merely a few months, as is the case at present. It has been satisfactorily proved that Port wine if sufficiently fermented will not only travel but will keep as long as most natural wines will keep without deteriorating, namely 16 or 17 years, and yet we find the reports of unbiassed observers of some years ago, which agreed in stating that all wine destined for exportation was largely fortified, confirmed at the present day by the wines themselves. Mr. Bernard, who visited the Alto Douro district for the British Government, estimated the amount of spirit ordinarily added to Port wine at 22 per cent., or a trifle more than 25 gallons per pipe. Baron Forrester, who was himself a grower, estimated it rather higher, namely, 26 gallons of spirit several degrees overproof; while Mr. Johnstone, of the testing department of H.M. Customs, considered 49 gallons of adventitious proof spirit per pipe to be nearer the standard of the Port wine ordinarily imported into England. One significant fact to which attention cannot be called too often, is that less than 10 years ago Portugal, which is not a dram-drinking nation, took upwards of 1,600,000 gallons of British spirits. It is true that it does so no longer, but simply because Prussia, where it markets to-day, furnishes it with a cheaper article distilled from potatoes and beetroot. It is notorious, moreover, that spirit of the same low class is extensively used in England to fortify Port wine in bond.*

Analyses made for the Portuguese Government showed the alcoholic strength of the partially fortified high class Villa Real wines to vary from 20 to 32° of proof spirit, whereas the strength of what are termed the "Commercial" wines—thanks to the analysers for teaching us that word—of the Company for the cultivation of the vineyards of the Alto Douro commenced as low as 36° and ascended as high as 40. Further, if more precise proof is needed of the continuance of the system of fortifying Port wine by the Douro wine growers, the comparatively recent report of the Viscount de Villa Maior to the Portuguese Government will provide it. Apropos of wines of the very highest class, he tells us that in the commune of Villa Real all wine intended for shipment has from 8 to 30 gallons of proof spirit per pipe added to it, either all at once when it is newly vatted, or else in small quantities at regular intervals. At Alijó it is the practice to add from 10 to 15 gallons of spirit, and at Regua from 14 to 33 gallons; wine for home consumption receiving but a quarter of this quantity. At Sebrosa equivalent to from 4 to 45 gallons of proof spirit are added according as it is intended to produce a sweet, dry, or geropiga class of wine, whilst at Murça the amount of adventitious spirit ranges from 15 to 30 gallons. The Marquis explains that inferior class wine when intended for export is invariably 20 per cent. dearer, owing to the cost of the spirit with which it has to be fortified. One hopeful circumstance for the future of Port wine is that he forewarns the Douro wine growers of a change in public taste, and points out that to-day light wines are required in preference to those of a highly alcoholic nature; and he urges on them the abandonment of the practice of extensively drugging their lighter wines to give them a fictitious character, insisting that they should strive to make wines that will keep without the addition of alcohol, and which can be shipped in a natural condition. He evidently is no believer in the stale pretence that Port wine when well made requires dosing with spirit to enable it to travel.*

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* The Customs returns give the total number of "operations," as fortifying of wine in the docks is technically termed, at 670 for the year 1872.

All wines made from ripe grapes, and the *must* of which is imperfectly fermented, as is the case with Port, retains an excess of saccharine, and when consumed as a general beverage is necessarily detrimental to health; whereas in a well-made wine all the sugar from the grapes is at once converted into alcohol, enabling the wine to keep, and, what is of far more consequence, rendering it wholesome. Any extraneous spirit added to the wine for the purpose of checking the fermentation, and enabling it to travel when perfectly new, simply enhances the injurious dietetic effect, and indeed it is this combination of sugar and alcohol which, according to the gentlemen of the faculty, induces gout in habitual drinkers of Port wine.

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* Memoria sobre os Processos de Vinificação empregados nos principaes Centros Vinhateiros do Continente do Reino. Lisbon, 1867.

No wine is imitated so extensively as Port. It came out in evidence 20 years ago that the average quantity annually exported to this country was 20,000 pipes, while the annual consumption amounted to no less than 60,000 pipes. In the evidence given before the Parliamentary Committee respecting the import duties on wine some startling disclosures were made àpropos of counterfeit Ports, showing that certain kinds were concocted out of Cape wine, cyder, and brandy; others with common French, Spanish, and Sicilian wines, and a liberal admixture of raw spirit; others again from Spanish and Cape, or Spanish and Canary, with a moderate allowance of French and Portuguese wines and a copious supply of the all-necessary alcohol. White wines, such as Marsala and Canary, were added in moderate quantities to give to the wine the approved tawny hue. These mixings were made in the London docks, the spurious Port being presumably for exportation, but it doubtless frequently found its way back again, and passed down the throats of the British public. One of the witnesses produced a book, evidently well known to those for whose benefit it was prepared, having gone through its four editions, called the Victualler's Guide, and which gave receipts not only for the manufacture of spurious Ports, but for communicating a fine crusted appearance to the bottles, and imparting the requisite look of age to perfectly new corks.

Now a days spurious Port is produced on a large scale at Tarragona in Spain, which imports considerable quantities of dried elderberries presumably for deepening the colour of, if not for actually adulterating, the so-called "Spanish Reds." A couple of years ago I tasted scores of samples of fictitious Ports in every stage of early and intermediate development, rough, fruity, fiery, rounded, and tawny, in the cellars of some of the largest manufacturers at Cette, and saw some thousands of pipes of converted Roussillon wine lying ready for shipment to England and various northern countries as vintage Port.

II.—*Other Wines of Portugal.*

Braga, considerably north of Oporto, and at some distance from the sea coast, sent an immense number of samples, comprising all the *consumos* of the surrounding districts, made from unripened grapes, the majority of which were cold, tart *vins verts.* Cabeceiras de Basto contributed one better class specimen of a ruby tint, dry and aromatic, reputed to travel well and to keep a moderate time, which only a portion of the ordinary wines of Portugal will do, and for which the price on the spot was half-a-crown per gallon. Celorico de Basto, which was so completely ravaged by the oidium that its produce has now fallen to less than one-sixth of what it formerly was, sent merely some *vins ordinaires* which for the purpose of local consumption fetch as much as from 6*l.* to 8*l.* per pipe, and to which honourable mention was accorded. Viera likewise contributed mere *consumos* of an inferior quality and capable of keeping only for a very short period even by the aid of added alcohol.

Honourable mention was made of one of six exhibitors from Barcellos, who with a single exception sent merely the common wines of the district, which, although poor in character, are bought up for export owing to the conveniences which exist for shipping them. Only the better made wines will keep for as long as three years, and this moreover without at all improving. The wines from Espozende on the sea coast were equally inferior in quality. Many of these weak Braga wines had suffered more or less from the journey or the heat.

From Vianna, still on the coast and in a more northerly direction, came samples both of the better class and the ordinary wines of the district. They are mostly of low alcoholic strength, and will not keep beyond their second year. Generally they were acid, and some had turned actually sour; a few were of considerable body and good colour but with scarcely any perfume, and all of them showed a tendency to deposit crusts. There were three varieties of Monsão wine; one of a fine ruby tint, with body, but somewhat astringent; a second the colour of dried rose leaves, thin and rather tart; and a third of a golden hue, sweet, yet at the same time palpably acidulous.

The Villa Nova wines from the extreme northern point of Portugal possessed body and flavour combined with a slight acidity. Formerly, the produce being considerable, these wines only commanded 1*l.* per pipe, and were consequently principally distilled into brandy, but since the vine disease they have fetched as high as 10*l.* to 12*l.* per pipe for local consumption, owing to the difficulty and cost of transport in the out-of-the-way districts of Portugal. From Braganza, also on the northern frontier of the kingdom, there was simply a single exhibitor, whose samples of red wines showed however what the district was capable of producing, and met with honourable mention. Generally their colour was good, but they had no particular body, were more or less astringent, somewhat sweet and acidulous at the same time, and possessed a slight aromatic bouquet. The Arcas and Lamalonga red wines were the best, due entirely to a more advanced method of vinification than is commonly in vogue in the upper part of the province of Traz-os-Montes. From the commune of Alfandega da Fé, where most of the wine is made with a mixture of red and white grapes, the Gouveio, the Malvasia, the Conaifesto, and the Mouriseo, came some good *consumos*, ripe and full flavoured. The white wines, both dry and sweet, were topaz-coloured, limpid, spirituous, and aromatic, one of the former being not unlike a dry Madeira. The samples from Villa Flor, in the southern portion of the same province, were of good ordinary quality, slightly tonical, yet agreeable in flavour. One here had the opportunity of judging between the natural, or almost natural, wine and the highly drugged compound, some of the Villa Flor specimens having been largely fortified and nursed into what were termed first class wines for the purposes of export, and manifestly to their disadvantage.

Of the wines produced to the south of the Douro a considerable collection came from Vizeu chiefly from the vineyards lying between the Mondego and the Dão, and more especially along the banks of those rivers. Some of the red varieties destined for home use were low in colour, *vinhos de maia cor* as they are styled. Others were of a far deeper tint and possessed moderate body and some little perfume; several of them being dry and soft and even velvety. The Vizeu wines appear to have the rare merit of keeping for a considerable time, as was evidenced by the samples exhibited of the vintage of 1858. Of the white wines there was no older vintage than 1870. After being duly brandied the better class red varieties are frequently shipped as Douro wines to the Brazils and elsewhere. A medal for merit was awarded to the municipality of Vizeu for the complete collection of wines which it had sent, and a similar medal was given to Senhor J. Marques for his white and red wines of 1870 and 1872.

The Bairrada region, next in importance from a viticultural point of view to that of the Douro, was of course represented at Vienna. Although its wines are only of medium quality, being more or less harsh, the red varieties, often full bodied, and always deep in colour, are largely exported as the genuine products of the Douro vineyards. Possessing, moreover, considerable alcoholic strength, and being heavily taxed on their way down the Mondego to Figueira, the port of shipment, they are subsequently diluted with water to increase their bulk—a proceeding which their high alcoholic strength admits of—and then mixed with the wines of Beira and other localities, one result of this process being that they will keep only half a dozen years and never improve in quality. The white wines as a rule keep rather better than the red.

Of the dry red Lavradio wines several were excellent and one sweeter variety was most peculiar. It was stated to have been made from the Morillon grape, and possessed a rich liqueur-like balsamic flavour, which was alike novel and captivating. Some samples from the vineyards of Seixal, Moita, Alcochete, &c., were less alcoholic than the wines of Bairrada, but equally deep in colour and more delicate and aromatic, while those from Coimbra, on the river Mondego, were thin, astringent, and tart, the more spirituous samples, from Guarda on the eastern slopes of the Estella mountains, being generally of the same thin, sharp, and coarse character. To some superior samples of the Coimbra wines exhibited by Senhor A. J. Almeida a medal for merit was allotted.

From immediately north of the Tagus we had quite a collection of the highly potent red wines of Castello Branco, but only in two instances was honourable mention made of them, while from the vineyards in the district of Santarem came the equally potent wines of Cartaxo, for the high alcoholic strength of which the merchants who buy them up are said to be responsible. It is they who compel the growers to fortify their wines by exacting from them a thick, dark, spirituous and sweetish fluid, the taste for which they know to exist, and which they do their utmost to maintain instead of encouraging the growers in the production of wine of a pure and wholesome character. It is the same with the Arruda wines, the natural alcoholic strength of which never exceeds 12 per cent., whereas on their coming into the market, this is invariably 16 per cent.—equivalent to 27° of proof spirit—and upwards. These latter wines were full bodied and deep in colour, but with a very decided flavour of tartar, which neither time nor adventitious spirit seemed to have succeeded in obliterating. The Azambuja growths, dark, full bodied, tart, and spirituous, were apparently of a purer type. Of a couple of these wines honourable mention was made.

The Torres Vedras wines, which have the reputation of being very varied in character, due it is said to the diversified nature of the soil, the aspect of the slopes, and the alluvial richness of the plains, were but indifferently represented. Several of them were a little crude, but with full vinous flavour; others were extremely soft, rather sweet, thin, and pale in colour, in fact altogether less robust, and understood to arise from the grapes having been picked from their stalks before being pressed. All these wines without exception are fortified before they come even into the home market. The

Torres Vedras vineyards yield annually over a million and a quarter gallons of wine, and two-thirds of the common wine drunk in Lisbon comes from this district, while much of the remainder passes under the name of Torres wine, being sold in goat skins like the genuine article to give it the desired odour of the original.

The Calvel vineyard in the neighbourhood of Torres Vedras produces a wine of a reddish violet tint, which in a few years turns to ruby colour, when the wine acquires a balmy perfume, the piquancy of which increases with age. The mountain wines of Cadaval and Alemquer grown in the same district, though somewhat thin, were found to possess considerable flavour.

The exhibitors from Lisbon sent samples of the many different wines grown in the neighbourhood, including alike the light and the full bodied, the sweet and the acidulous, the feeble and the spirituous. Two medals only were given for these wines, one to Senhor J. Brito, the other to Senhor A. P. Cardosa. First came those of the Olivaes district—so called from the olive trees growing there in such abundance—comprising the agreeable flavoured wines of Camarate which keep well, and when old have a certain resemblance to natural Port, and the no less pleasant wines of Cadaval. Hence too came several varieties of Bucellas, the newer wines acidulous and somewhat frothy, the finer matured vintages clear and bright in colour, exceedingly soft, with a suave delicate sub-bitter taste, and a volatile and expansive bouquet. The red Bucellas wines which had been kept for a dozen years resembled the white in flavour and aroma, and even in colour. When new they have something of the character of a Bordeaux wine, with however a more decided sharpness of taste. Bucellas is produced from the Arinto grape supposed to have a certain affinity with the Riesling, hence that fresh acidulous flavour which characterises the wine when young.

The wines from the Termo of Lisbon included those of Collares, light almost as the growths of the Gironde, and the finer samples combining moderate softness and delicacy with the same refreshing sub-acidity. These are the natural wines of Portugal, both red and white varieties of which were so highly extolled by the late Baron Forrester in his evidence before the Parliamentary Committee on the wines duties in 1852, and which he estimated at that epoch at from three farthings to threepence the bottle. Unfortunately many of the present samples had been fortified in accordance with the prevailing Portuguese practice, with respect to all wines destined to travel. Beside the Collares were some fine samples of the topaz tinted, rich, muscat flavoured, spirituous and somewhat famous white wines of Carcavellos grown on the vineyard slopes near the mouth of the Tagus. The dryer varieties, which were paler in colour and extremely soft, had a pleasant sub-acid flavour, which was also developed in the red wines in combination with a certain astringency. Of the collection of these wines exhibited by Senhores P. Jorge and J. C. Santos, honourable mention was made.

From the left bank of the river came the wines of Setubal including the famous muscats of Azeitão, the younger samples of which were very sweet and at times a little bitter, while several of the older varieties of a rich topaz tint, had acquired a perceptible etherous bouquet. One rose colour Muscat was especially nectarious like, and delicate in flavour. These wines were awarded a medal for merit. The remaining vineyards on the same bank of the river, notably those of Chamusca and Almeiria, produce only coarse full bodied and highly alcoholic wines, which are almost exclusively distilled into brandy.

Portalegre, some distance south of the Tagus and on the Spanish frontier, sent several thin, astringent, and slightly spirituous wines, quoted at about eighteen pence per gallon on the spot, and consumed exclusively in the locality. The wines of Extremoz were darker in colour, less alcoholic, and had an unpleasant bitter flavour, which in some samples was positively repugnant. This evidently arose from a bad system of vinification and from the grapes being imperfectly ripened. The Borba and the Elvas red wines were less disagreeable, but as, like the majority of the Portuguese samples, they had been fortified, this may have subdued any decided unpleasantness of flavour. The white varieties were dry and often harsh when they were not bitter. The Evora wines, of which a considerable number of samples, both white and red, ranging from 1862 to 1872, were exposed, possessed more character, although many of them were evidently badly made; some of the red varieties being not only exceedingly thin and pale in colour, but acidulous to the point of positive sourness. Vinification is carried on in a slovenly fashion in this district, the grapes are carelessly gathered and not sufficiently pressed, in addition to which the must is fermented in large uncovered jars into which all kind of refuse manages to penetrate. Owing to this merely honourable mention was made of these wines. The Villa Viçosa wines, which are largely exported, were of good ordinary quality, while the samples from Redondo, Cuba, and Ferreira, also large wine exporting districts, were generally of a more delicate character. The wines of Beja were unrepresented, but the specimens were numerous of the fine and naturally spirituous wines of Tavira, Olhão, Fuzeta, and Lagos, in the extreme south, which, less alcoholized than the Portuguese wines generally were, exhibited considerable *finesse*, combined with a very distinct character of their own, being soft, dry, generous, and very slightly astringent, with fine colour and some little bouquet. Three medals for merit were awarded to Senhores T. A. Fonseca, F. C. Mata, M. Mendonca, and A. A. L. de Miranda, whose samples of these wines were of the very highest order.

Some few years ago a considerable number of samples of Portuguese wines were analysed at the Lisbon Agricultural Institute, under the authority of the Government, when their alcoholic strength, and other prominent qualities, were duly recorded. Unfortunately, however, the published tables do not specify which particular alcoholic scale was adopted, but assuming that the degrees indicated refer to pure alcohol, the per-centage of proof spirit which the wines analysed respectively contained is given correctly below. It should be remarked that among the samples were a considerable number of so-called "commercial" wines which had been largely fortified, and that it is by no means certain even a single specimen was entirely free from adventitious spirit. Wines of Braga, 11¼ to 18 per cent. of proof spirit; Braganza, 21½ to 26¾; Vizeu, 21¾ to 31½; Aveiro, 20 to 23; Coimbra, 16; Guarda, 21 to 27; Castello Branco, 25⅓ to 32⅓; Santerem, 24½ to 30; Azambuja, 28¾; Torres Vedras, 30; Cintra, 18½; Alemquer, 24; Lisbon, 32 to 33; Carcavellos, 35 to 41; Bucellas, 30½ to 37¾; Setubal, 25 to 32, and its Muscat wines, 34; Portalegre, Extremoz, Borba, Evora, and Villa Viçosa, 23 to 26; Elvas, 32; and Faro, 26 to 27½.

The vineyards of Portugal, excluding those of the Douro district, of which the area has been already stated, occupy a surface of 392,750 acres, and are estimated to yield on the average 100,000,000 gallons of wine, which, with the 11,000,000 gallons produced on the Douro, give a grand total of 111,000,000 gallons. The total exports, exclusive of Madeira, for the year 1870 amounted to 7,400,000 gallons, nearly three-fourths of which were fine wines, the gross value being estimated in official documents at 1,851,000*l.* Upwards of three-quarters of the exports were to Great Britain.

III.—*The wines of Madeira.*

The samples of Madeira were among the most remarkable of the Portuguese collection, and would have delighted the rare remaining connoisseurs of this once highly prized wine. The exhibitors were all from Funchal, and the most matured samples were those contributed by Welch Brothers, who had gained a gold medal at Paris in 1867. Madeira is a wine which it is commonly said can never be drunk too old, and certainly the samples of the 1818 and 1828 vintages submitted by this firm did not appear to have passed their prime. Both of them, while retaining a certain fullness and vinosity, due in a measure to the alcohol which had certainly been administered to them in moderation in their youth, had developed that suppressed bitter flavour, and emitted that nutty aroma characteristic of the matured wine. The samples exhibited by Sampaio and Co. were simply young wines, which had acquired some little mellowness, but evolved neither that diffusive perfume nor that sub-pungent flavour which Madeiras acquire only by length of years. The mellowness in question was very likely due to artificial means, as it is a common practice to subject the young wines both to heat and motion with the view of more rapidly subduing their harsher qualities. These wines were quoted in bulk as low as at the rate of four francs the bottle, and both firms had medals for merit awarded them; the one for its rare and venerable samples, the other for a good wine at a remarkably moderate price.

Doctor Pitta exhibited five different kinds of Madeira, including Boal of 1830 priced at 16 francs, and Serceal of 1836 priced at 18 francs the bottle, both dry wines and the latter of high flavour and characteristic bouquet. In addition were two dry Madeiras of 1845 and 1850 vintages—both in perfect condition and possessing much of that magnificent flavour which distinguishes the fully ripened wine—with a red wine of 1869, which, although agreeable enough, had a somewhat astringent taste.

The cream of the collection, however, was some natural Madeira exhibited by Baron da Conceiçao, a wine perfectly free from adventitious spirit, full, soft, and delicate, but with a distinct rich vinous flavour, evidently derived from a partial admixture of the Malvasia grape, which, in conjunction with the Verdelho species, produces some of the finest wine. An excellent Madeira of 1869 vintage exposed by the Baron was quoted at 60*l.* the pipe free on board. A medal for progress was given to this exhibitor as well as to Dr. Pitta.

After the Madeira vineyards were ravaged by the oidium in 1851–2 scarcely any wine was produced in the island for the next five years, most of the vines being rooted up and sugar canes planted in their place. For 10 or 12 years past, however, the cultivation of the vine has been resumed, and the annual production shows a steady increase, although the present yield is merely a per-centage of what it formerly was. In 1870 Madeira produced 6,000 pipes of wine of all kinds, equal to 552,000 gallons, of which it exported merely 95,300 gallons, valued at 72,500*l.* Of this quantity nearly 70,000 gallons went to England. In 1872 the production had risen to 7,000 pipes or 644,000 gallons.

The 92 exhibitors of wine from Portugal and Madeira obtained five medals for progress and 17 medals for merit, and had honourable mention made in 26 instances.

THE WINES OF SPAIN.

I.—Sherries.

Spain, spite of its internal dissensions, was well represented at Vienna, so far as its natural products, and more especially its wines, were concerned, for nearly three-fourths of its 49 provinces sent samples of their vinous products to compete for prizes. From Cadiz and San Lucar came all the varieties of the Jerez district, from the pure, pale, thin, and dry Manzanillas, to the dark, rich, and sophisticated old fashioned brown Sherries, from which every trace of the flavour of the natural wine had been carefully eliminated. The most antiquated sample of *vino fino* of Jerez belonged to the days when the Holy Office in Spain still sent an occasional heretic to the stake, being of the ripe old age of 120 years, and still rich in colour, and of powerful flavour, derived, however, from the caramel and the brandy, with which last it must have been liberally saturated both in its youth and in the course of its prolonged existence, rather than from any well preserved vinous qualities of its own. It was much the same with a second sample of the comparatively juvenile age of 40 years, which retained all its adventitious colour and alcoholicity, and little else beside. Indeed, as a rule, the Spanish wines submitted at Vienna, although there were a considerable number of marked delicacy and character, recall a long array of highly-fortified samples in which the natural flavour of the wine was drowned in the fumes of adventitious spirit.

The exhibitors of the finer varieties of Jerez wines, dry, delicate flavoured, and highly spirituous, although reported to be free or almost free from added alcohol, carried off their fair share of medals for progress and merit. Señors D. de Agreda and Gonzalez Byass and Co. secured the higher class reward, and to five Jerez firms, namely L. Herran and Co Keppel Heselink and Co., J. M. Picardo, J. M. Pico, Pola, Brothers and Co., and Santareli Brothers medals for merit were awarded.

There was a very complete collection of Manzanillas, those thin, dry, and highly tonical wines deriving their name from a certain similarity of flavour and fragrance with the manzanilla, or camomile, a circumstance which has given rise to the erroneous belief that camomiles are thrown into the vat while the wine is fermenting. These wines are reputed to be the purest of Sherries, simply because the "rearers" find they will not blend kindly with other growths. In the samples exhibited, which, with rare exceptions, were almost as colourless as they were thin, all the natural spirit of the wine seemed suppressed, as it were, by the bitter medicinal flavour which is its distinguishing characteristic, and which age did not appear materially to subdue. The finest Manzanillas were contributed by Señor E. Hidalgo, of San Lucar, who had a medal for progress awarded for them, while Señors J. and J. A. Martinez, also of San Lucar, both received medals for merit for the same wines. It is within the triangle formed by San Lucar de Barrameda, Jerez, and Puerto de Santa Maria that the best Manzanillas are produced. The soil, which is principally a mixture of clay, sand, and chalk, with a considerable predominance of the latter, is highly favourable to the growth of the vine, which yields a grape full of flavour. It is to this peculiarity of soil rather than to the variety of vine that the well-known bitter aromatic flavour of Manzanilla is due; other wines of the Jerez district produced from the same kind of grape being deficient in the identical *goût*. One speciality of Manzanilla is that the must is always perfectly fermented, the result being an exceedingly pale and thin wine, entirely free from heat, and yet containing a considerable amount of natural alcohol, enabling it to keep for nearly 30 years, and with every year added to its age sensibly improving in flavour. Perfectly young Manzanillas are to be had on the spot for as little as 10*l.* per butt of 106 gallons, but in the course of three years the nursing of the wine will have doubled this price, and by the time it is 10 years old and in fine condition it will have risen to quintuple its original value.

Among the *vinos finos* of Jerez and the Manzanillas were samples of some which had developed into Amontillados, exhibiting that well known etherous flavour usually encountered most frequently in the higher class natural Sherries and certain of the white wines of Greece. The theory is that as the alcohol contained in the wine absorbs the oxygen of the atmosphere, preparatory to the wine passing into acetic acid, it first of all transforms itself into aldehyde, the presence of which in wines the French chemist Maumené regards as of considerable importance, contributing as it does to the formation alike of their flavour and perfume. Mr. J. L. Denman, who has studied the development of aldehyde in the Greek wines, is of opinion that the flavour and bouquet, which he believes to be generated only in fine, sound, and full bodied wines, are due to the ether produced from the absorption of alcohol by flowers of wine, and is moreover common to all wines developing a vinous growth, which he thinks is rarely if ever accompanied by an acetous growth. A medal for merit was awarded to a fine sample of Manzanilla-Amontillado—in which the etherous bouquet and flavour had sensibly modified the original tonical *goût*—exhibited by Señor Salvador Helvant, and quoted *in loco* at 5*l.* the arrobe, or at the rate of 5*s.* the bottle.

The fine wines of Montilla so famous throughout Spain in the olden times are said to develope this highly prized Amontillado flavour. Of late years, since the introduction of railways has lessened the cost of transit to the coast, an export trade in the ordinary wines of Montilla has sprung up, and Cordova sent samples of them from various growers to compete at Vienna. Generally, they were deficient in brightness, and several were rather thin, with a suspicion of the sub-acidulous flavour of a Rhine wine. The more recent vintages had nothing specially remarkable about them, for Montilla above all the wines of Spain requires considerable age to arrive at full perfection; but the older vintages without exception proved to be full and mellow wines much deeper in colour than any natural Sherry, richer too in aroma, and usually of high and splendid flavour. For one fine sample Señor Blanco of Cabra obtained a medal for progress, while for other samples exhibited by Palma and Gueseda, and Albear and Co., medals for merit were awarded. One of the last-mentioned wines was in its 46th year and still remarkably spirituous, with a full nutty flavour. Montillas of the highest class are rarely met with in commerce, their shrewd owners preferring to reserve them for imparting character to their commoner growths.

Of *vinos de pasto*, light, dry, highly flavoured Sherries very unlike the spirituous wines frequently sold under this designation in England, being, as their name implies, simply table wines, samples of a superior character were far from numerous; merely some few manifested a fine aroma and corresponding delicacy, the result invariably of age, a most important element in all Spanish wines of the smallest pretension.

Sherry being the wine the annual consumption of which in England exhibits an increase far beyond any other, and this too in spite of its being the least natural of all wines, one may here venture upon a rapid glance at the system of vinification prevailing with regard to the ordinary wines of the Jerez district and the amount of sophistication they undergo to prepare them for the English market, in order that Sherry drinkers may understand the kind of compound they usually consume with the conventional sandwich or biscuit, and the Liebig extract soup, and the colour, body, flavour, spirituosity, and keeping power of which are all due to adventitious aids.

The grapes being spread in a trough in the lagar are first dusted thickly over with plaster of Paris, in order that all their tartaric acid may be precipitated, whereby that natural acidity which all young should wines possess is at once removed. They are then pressed by treading and by means of a powerful screw. The commoner *musts* are next subjected to the process of sulphuring, which is accomplished by impregnating the vats with the fumes of sulphurous acid and pumping the *must* into them from below through a kind of sieve, which ensures the complete absorption of the acid. Ordinarily five or six ounces of sulphur, yielding almost double that quantity of sulphuric acid gas, which ultimately becomes resolved into nearly 1 lb. of solid sulphur, are used to each butt of wine, some Sherries being charged with even quadruple this quantity, and this solely with the view of preventing the improperly fermented wine from turning sour while resting in casks with a considerable vacuum exposed to a temperature approaching fever heat. During the ensuing March spirit is added to the wine, the finer qualities receiving a couple of gallons to the butt, and the commoner ones as much as six gallons. This is simply the first dose, for sulphured Sherry cannot be properly clarified without having its alcoholic strength materially raised, besides which, whenever the wine chances to fall sick, as it frequently does, spirit, the pabulum for all disorders with rearers of common Sherry, is again had recourse to.

The wine which forms the bulk of even the better class Sherries imported into England is of the third quality and known as *raya*. In its natural state it is sound and dry, of a pale greenish yellow colour and has no particular character. Much of the low class Sherry shipped from Cadiz is blended moreover with poor white wine from the Condado de Niebla, a considerable viticultural district on the right bank of the Guadalquiver, extending between Huelva and Moguer in the direction of Seville. Samples of this *petit vin blanc* were exhibited at Vienna. When the wine is designed for shipment it is sweetened and flavoured to disguise its deficiencies of taste, and coloured in order that it may be palmed off as old and matured. Mere sweetening is accomplished by the admixture of cane sugar, and sweetening and flavouring combined by the addition of Dulce made from the *must* of over-ripe grapes, the fermentation of which has been checked by the addition of overproof spirit. This liqueur gives at the same time a little extra colour and body to the wine. At Vienna numerous samples of this syrupy compound were exhibited including Garnacha dulce, so named from the species of grape from which it was made, four years old and possessing all the character of a liqueur Sherry with no excessive predominance of either sweetness or spirit. Far more sweet and fiery was a liquid termed Mutela doble, the label on which candidly enough explained that it was for mixing with dry wines designed for exportation to England.

The colouring matter used for low class wines is produced by boiling a certain quantity of plastered must in a large copper for from 15 to 20 hours until it is reduced to one-fifth of its original bulk and is of the consistency of treacle, taking care to constantly skim it. The result is a deep reddish-brown liquid with a bitter, aromatic, and singularly disagreeable taste arising from the sulphate of potash which has been generated, and which a liberal admixture of alcohol fails to disguise. According to the dose administered of this so-called *vino de color* varying shades of colour are given to the commoner wines. Thus the conventional pale Sherry will need only seven gallons to the butt, whereas the golden will require 15 gallons, the pale-brown 20 gallons, and the rich old brown as much as 25 gallons.

This however is not all; the wines require to be again brandied before they can be shipped, and the smaller the dose of alcoholised *vino de color* they have received, the larger the quantity of adventitious spirit requisite to be administered to them to keep down any fresh fermentation to which the additional saccharine might give rise. What this amounts to is apparent from a recent correspondence in the Times newspaper, in the course of which Mr. C. H. Vince stated that many hundreds of tests made by him in Spain of young wines, the primary fermentation of which was complete, gave an average of 26 per cent. of proof spirit. Mr. Walter Burton of Her Majesty's Customs supplemented this by asserting that of many thousand tests which he had made at the London Custom House, not one showed less than 37 per cent. of proof spirit, while some exhibited as much as 50 per cent., and he pertinently demanded "How this enormous quantity of alien spirit could be added to Sherry without certain risk to the health or head of the unsuspecting consumer."

The above remarks apply of course exclusively to the conventional Sherry in common consumption, such for instance as is served at taverns and refreshment bars, provided at public dinners, and figures on the wine lists of the majority of hotels at 6*s.* the bottle. The finer wines and some of the commoner natural varieties which are gradually making their way in England, are of a different character, still even the finest Sherries are plastered and subjected to other manipulations, which however scarcely affect their purity. For instance they are more or less sweetened and tinted with Dulce and *vino de color* of the purest quality. In addition every rearer of wine has his soleras, comprising his highest class wines which by age, care, and attention have acquired alike body and character, and which he sparingly uses to mix with and improve the quality of newer and inferior vintages. These butts of stock wines are drawn from in equal proportions, and replenished from time to time by promising wines of younger growth. In these soleras all individuality of origin and year of vintage become in a measure obliterated. When newly made up from numerous small selections they represent simply a mixture of an infinite variety of wines. Old soleras on the other hand represent a *mélange* of small residues from the wines of a considerable number of years, of which the most recent commonly presents by far the largest proportion.

With regard to the alcoholic strength of the natural Jerez wines, samples procured on the spot by Mr. Bernard for Her Majesty's Commissioners of Customs were found to contain from 26½ to nearly 28° of proof spirit. Two exceptional Amontillados, the origin of which was somewhat obscure, showed, however, upwards of 29 and 35° respectively. Some fortified wines of the highest quality obtained by him at the same time contained as little as 27 and as much as 36 per cent. of proof spirit, while perfectly pure Montilla wines varied from 30 to upwards of 33°.

The Jerez vineyards spreads themselves over a succession of undulating chalk hills, the surface soil of which is light sand and clay impregnated with oxyde of iron and largely intermingled with carbonate of lime, and which goes by the name of *albariza*. It is this which produces the finest and the strongest wines, still the yield is only moderate in quantity. The soil of the intervening valleys, overspread with frequent alluvial deposits, is principally dark clay, mixed with red and white sand, loam, and carbonate of lime, and containing iron oxide in considerable quantity. This soil, known as *bugeo*, is by far the most fertile, but it produces only coarse unclean wines. The soil of the plains is white sand impregnated with chalk and clay, strewn with stones and coloured with iron. This is termed *barros* or *barro arenas* and yields wine in considerable quantities but poor in quality.

The vines principally cultivated in the Jerez district are of the Mantuo variety, of which the Castellano, a prolific bearer yielding large berries as well as large bunches, is perhaps more prevalent than all the others combined. The grapes, however, which give character to the wine are the Palomino of medium size and of an opaque green tinge, yielding wines which develop into Amontillados, and the Perruno with small berries of a yellowish bronze tint, from which Sherries of high flavour and perfume known as Olorosos are produced. The medium size greenish white grape of the Pedro Jimenez vine, commonly but erroneously supposed to be the prevailing vine in the Jerez district, is chiefly employed in the production of Dulces, used as already explained for sweetening and colouring Sherries of an ordinary and commonplace character.

II.—*Other Spanish Wines.*

Beyond its collections of Jerez, San Lucar, and Montilla wines, Andalusia sent samples to Vienna of some of the best growths in the neighbourhood of Moguer, all more or less of the Jerez type and several of a delicate Amontillado character. Medals were assigned for these to Señors E. G. Diaz, X. de Tejada, and R. Torcies respectively. Some fine white wine also came from Seville, and from Jaen to the north-east of Montilla. The luscious full-flavoured gold colour wine called Pajerete produced in the vineyards belonging to the convent of the same name from the sweet Pedro Jimenez grape, with Tinto de Rota from immediately opposite Cadiz, were likewise represented. One sample of Tinto was found to be a perfectly fermented wine, free alike from sugar and adventitious spirit, and having scarcely anything in common with the well-known sweetened brandied sacramental Tent prepared especially for English communicants.

The Malaga wines both sweet and dry are widely known, and the entire country between this port and Granada is one vast vineyard producing for the most part clean full bodied wines; still the samples sent to Vienna were comparatively few, and gave, it was said, a most imperfect idea of the variety of wines which this prolific province produces. So favourable is the mountainous district in the neighbourhood of Malaga to the development of the vine, that three crops of grapes are produced each year. It is from the second crop gathered in September that the dry wines are made, while the third vintaged during the following months yields the sweet Malagas. The latter were in abundance at Vienna, rich, deep amber colour wines in which the bouquet and soft spirituous flavour, the result of age in genuine Malaga, were very partially developed. The dryer varieties conveyed the idea of these naturally powerful wines having been unnecessarily fortified, while others more delicate in character evidently had their original flavour less disguised by alcohol.

The largest collection of Malaga wines was contributed by Scholtz Brothers, who had a medal for progress awarded to them. It included dark sweet Malaga 92 years old—this class of wine it should be remembered enjoys the reputation of keeping for a century—perfectly preserved, no doubt in added spirit, and developed into dryness by age, and which was quoted at 10*l.* the arroba, rather below 10*s.* per bottle shipped on board. The 1810 vintage was priced at 7*l.* and the 1870 as low as 1*l.* the arroba of 3½ gallons. Sweet white Malaga of the last-mentioned year was estimated at a similar rate, but the 1840 vintage, the oldest samples exhibited of this class of wine, was priced at 50 per cent. more than the darker variety. These sweet Malagas are made from the Pedro Jimenez and Doradillo grapes, which after being gathered are dried for several days in the sun, depth of colour being imparted to the darker wines by the addition of *must* boiled down to one-third of its origina bulk and intentionally burnt in the boiling. The same collection comprised the dry white wine with a certain resemblance to Sherry termed Malaga-Jerez, also Malaga-Muscat made from the Pedro Jimenez grape, a certain quantity of Muscat being added to give it the approved flavour and aroma, and finally the syrupy Tintilla produced from the same variety of grape from which Tintilla de Rota is made. Other exhibitors contributed samples of sweet Mountain Lagrima, a liqueur wine priced at less than a couple of francs the gallon, and of the so-called Cherry wine of the locality, which is simply sweet Malaga in which acidulous cherries have been steeped.

From Villaviciosa in the Sierra Morena some distance north of Posadas, came samples of more than one remarkable wine, while Ciudad Real on the opposite side of this mountain range sent quite a collection of red and white Val de Peñas, so named from the stony valley in La Mancha where these wines are grown. The white varieties which had a tendency to sweetness were in no degree remarkable, whereas the others were the classical red wines of Cervantes—famous for centuries from the allusions to them in Don Quixote—wines with ample body and that peculiar sub-bitter flavour common to many of the growths of the Côtes-du-Rhône. Each description of reward was allotted to these wines, the highest being conferred on the Marquis de Benamejis for the superior character of the samples contributed by him. New Castille further sent some fine full flavoured red wines from Toledo, of which those exhibited by Señor L. Fernandez were unanimously classed in the first rank, also samples of Vino Torrantes varying from five to 20 years old, from Guadalajara, north-east of Madrid, and some spirituous and aromatic white wines from the vineyards bordering the Spanish Tagus between Arganda del Rey and Talavera de la Reyna.

The wines of the Spanish peninsula most in abundance were the deep coloured full bodied *vinos tintos* of the Mediterranean coast, known in England as Spanish Reds. Carthagena sent merely three sets of samples of its red wines and secured a medal of merit for them, whereas Murcia sent about a score and failed to secure a single medal. Both the dry and sweet wines of Valencia—the so-called garden of Spain—were amply represented, and the contributions from Alicante and Tarragona numbered several hundreds, yet the samples from Barcelona must have been as numerous as those of all the other Mediterranean ports combined. The Alicante wines were principally sweet, and strong as they were luscious. Many of them were of the consistency of syrup and several suggested the flavour of molasses. All were more or less brandied, requiring to be fortified, it was asserted, to ensure their keeping for any length of time. On the spot they were to be purchased at the rate of 1*s*. 6*d*. per gallon; the dry, dark, coarse, common class wines being about half this amount. Eight medals were awarded to exhibitors from Alicante of sweet, red, Malmsey and Muscat wines; and of four others honourable mention was made.

The lower qualities of the coarse and spirituous red wines of Valencia are principally distilled into brandy, while those of higher pretensions are largely used for simulating Port and for blending with genuine Oporto wine. The sweeter varieties have ordinarily little else beyond their full flavour, syrupy character, and a certain softness to recommend them. It is different, however, with the Priorato, a more or less sweet, spirituous, red wine, closely resembling an extremely fruity Port and understood to be grown in the vineyards of some Valencian priory, whence its name. There were several kinds of Priorato, notably a Vino bajo Priorato of 1871, a velvety sort of wine, delicate in colour and with a slight bouquet, and which was said to be independent of added spirit; also a Priorato secco, in which the flavour of alcohol predominated; a Priorato mocado and a Dulce Priorato, the latter equally luscious and spirituous as the rest of the

Dulces, and clinging to the glass like so much syrup. This liqueur was priced at less than 1*s*. the gallon on the quay at Tarragona. Such merits as the Valencia wines exhibited were amply acknowledged by two medals for progress and six medals for merit, with honourable mention of four other exhibitors.

From Barcelona, Tarragona, and Reus came a bewildering array of samples, the whole or nearly the whole of which seemed more or less fortified with alcohol. In many of them there was a certain fullness of body, combined with considerable mellowness, and an agreeable flavour, due to the apparent absence both of sweetness and acidity, while others were remarkably sweet, and others again merely fruity. Some on the other hand were perfectly dry and even slightly rough. In nearly the whole of them, opposite as they often were in character, a rich vinous quality could be discriminated beneath the added spirit, and if the collection included nothing of a high class it comprised much that was interesting. Among the best wines were some Vino tinto generoso with Vino pinuelo, a deep tinted white, or else pale tawny wine of the vintage of 1851, and Vino generoso secco, a really fine red wine exhibited by Don J. Pedrossa of Esparraguera. The two latter were both classed in the first rank. There were also samples of *vinos rancios*, dry old wines of tawny tint and reported to be perfectly natural, yet exhibiting no particular character, with a Vino gral del Panadei of a brilliant light crimson hue, and a considerable number of ordinary and several better class *vinos tintos* rather deep in colour, generally full of body, invariably soft, and occasionally sweet. Those from Alella were very like a thin natural Port, while others were poorer and a trifle rough, or else loaded with adventitious spirit. The light wines of the so-called claret character, simply because they contained less than the recognised 26 degrees of proof spirit, very much resembled certain growths of the south of France, and were altogether inferior to the commonest productions of the Gironde, having nothing of their freshness of flavour.

The Tarragona exhibitors secured seven medals for merit for their red wines and their Garnachas and Muscats, the firm of Sobrano and Co. obtaining a medal for progress for some Maccabeo and the single sparkling wine of any character exhibited by Spain. Reus for some capital red wines received two medals for progress and one for merit, while Barcelona for its red wines, its Garnachas and Rancios, its Muscats, Malmseys, and Maccabeos obtained two medals for progress, nine medals for merit, and as many as one and twenty diplomas of recognition.

Sixpence per gallon and upwards appears to be the average price on the spot for the ordinary red Catalan wines; considerable shipments of which take place to England, the Spanish colonies of Cuba and Porto Rico, the Brazils, Buenos Ayres, and the River Plate. Incidentally it may be mentioned that some years ago Consul Crawfurd drew attention to the circumstances of dried elderberries being largely exported from Portugal to Spain, and he showed from the Oporto customs returns for 1866, that during that year no less than 145 tons were thus shipped. The conclusion to which this statement pointed was accepted without the slightest demur, and it is now very generally asserted that elderberries are used to deepen the natural colour of the so-called Spanish Reds, and enable them to be passed off in the above-named countries as veritable wines of Oporto. It is quite certain that merely a few of the numerous samples of Catalan wines exposed at Vienna were at all deep in colour, and only quite recently the Agricultural Council of the Pyrenées Orientales has been calling the attention of the French Minister of Commerce to the circumstance of wines imported from Spain being artificially coloured with elderberry juice. Within the last year or so it seems that France has become one of the best customers of Spain for these particular wines, the rich colour, full body, and fruity or at any rate non-acid flavour of which render them suitable for mixing with some of her own poorer growths; and it is quite certain that the bulk of the cheap clarets consumed in England possessing deep colour, body, and no perceptible acid flavour are not the Bordeaux wines they pretend to be, for the above characteristics are foreign to the wines in question, but are simply an admixture of Spanish Mediterranean wines and the *petits vins rouges* of France. From statements in the French trade journals it appears that Spanish wines of the class above mentioned can be imported free at one of the southern ports at the rate of a franc and a half the gallon, and they now figure regularly among the quotations of the Paris *Halle aux Vins*.

Aragon, represented by Huesca and Saragossa, sent many varieties of its red wines to Vienna, some exceedingly thin and pale as rose colour; also some Tinto secco of 1865 from Grañen many shades darker and very spirituous, with samples of the sweet white and dryer deep red wines of the Campo de Cariñena quoted *in loco* at from five to seven reals the cantaro, or from 6*d*. to 8*d*. the gallon, and which are largely exported abroad as well as extensively consumed at home. The Ribiera de Ebro wine was similar in character, and from the same district came one sample of the light aromatic red wine, known as Ojo de Gallo or Cock's-eye from its remarkable brilliancy, and highly prized by the Spaniards for its flavour; as also the scarcely less esteemed white wine termed Imperial blanco. A medal was given for Careñina wine to Señor Zapeta, and seven additional medals, including two for progress, were allotted to other exhibitors, among whom figured the Society of Aragon wine growers, for their samples of the wines of this province.

Biscay, which produces considerable quantities of wine, notably red and white varieties of an ordinary light wine called Chacoli valued at about 9*d.* per gallon, sent but few samples to Vienna. The Asturias, which boast of merely a few wines and those mostly good ones, sent one very interesting collection of samples including a fine Amontillado de la Nava del Rey, for which a medal for progress was awarded. From Valladolid and Palencia came some excellent wines, notably a fine Aostovillo, which likewise obtained a medal for progress. Navarre, which, spite of its unfavourable climate, grows some renowned Muscats, and considerable quantities of very fair red wines, sent samples of the latter from Pampeluna approximating in character to some of the growths of the Côtes du Rhône, and which met with due recognition, while a wine of 1861 from Logroño exhibiting remarkable *finesse* obtained a medal for merit for the Count de Cirati.

Several attempts have been made in Spain of late years to rival the more delicate growths of the Médoc and the Côte d'Or by importing the vines of those districts to the Peninsula. Judging however from the samples of red wine yielded by them these efforts appear to have been unsuccessful, the difference of soil alone sufficing to change the character of the wine and to deprive it of that fragrant bouquet which seems to be the especial property of more northern latitudes. Still some remarkably interesting samples of wine of a Médoc type of the years 1868 and 1869 were exhibited by the Marquis de Riscal of Elciego, in Navarre, who was awarded a medal for progress; a medal for merit being given for other samples produced from the Cabernet species of grape and contributed by Señor E. de la Vega of Guadalajara, near Madrid.

Very little information is available respecting the alcoholic strength of the general wines of Spain. Unfortified white varieties of Val de Peñas obtained by Mr. Bernard indicated 22° and 31° of proof spirit respectively, while a sample of red was just below 28°. The Malagas, fortified to an extent of 12 per cent., showed from 30 to 37½°, and the pure Valencia wines from 26 to 28½° of proof spirit. Natural

Benicarlo contained less than 24 per cent., that made up for the English market had between 31 and 32, while unfortified Alicante indicated from 28½ to upwards of 29 per cent. of proof spirit.

The principal vines cultivated in Spain besides those enumerated as grown in the Jerez district are the Tinto or Concejon, the Graciano, the Tempranillo, the Mazuella, the Doradillo, the Don Bueno, the Pasalarga, the Loja, the Colgadera, and especially the Garnacha, which surpasses all the others in strength and luxuriance.

There are no recent statistics with reference to the area and amount of produce of the vineyards of Spain, and such as exist are extremely incomplete and not altogether reliable. It would appear that in the Cadiz district there are nearly 24,000 English acres under cultivation with the vine, yielding about 6,000,000 gallons annually, which is very little in excess of the yearly consumption of so-called Sherry in England alone, and yet no more than half of this quantity is the produce of the Jerez vineyards. The remainder of the province of Andalusia is estimated to yield about 35,000,000 gallons, Catalonia produces 60,000,000 gallons, Valencia 16,000,000 gallons, Saragossa 14,000,000 gallons, the Rioja district in Old Castille 17,500,000 gallons, and Toledo, Huesca, and Ternel 6,000,000 gallons each. Malaga yields about 3,500,000 gallons, and Montilla and the surrounding districts upwards of 1,000,000 gallons. As in the foregoing list many important wine-producing districts are not included, the annual yield of the Spanish vineyards, including the wine reserved for distillation, might fairly be taken to amount to 300,000,000 gallons. Some statistics however, published by a landed proprietor of Catalonia, estimate it at more than double this quantity or 660,000,000 gallons, his calculation being based upon the large average yield of 418 gallons per English acre.

The total exports of wine from Spain in 1857, just as it was recovering from the effects of the vine disease, were 23,417,532 gallons valued at 2,602,876*l.* Of this quantity England took 2,777349 gallons. By the year 1872 our consumption of Spanish wines had increased 150 per cent., being no less than 6,923,442 gallons. The Sherry shipped to England the same year formed 35 per cent. of the total quantity of wine imported, and during this period the importation of Spanish red wine rose, moreover, to 1,356,537 gallons. The consumption comprised 5,926,986 gallons of the white, and 996,453 gallons of the red wines of Spain, forming the total of nearly seven millions of gallons above referred to, and being upwards of 41 per cent. of the entire quantity of wine consumed during the year in Great Britain.

III.—*Wines of the Balearic and Canary Isles.*

The Balearic Isles, and more especially Majorca, sent a very fair collection of their better class red and white wines, notably Aleyor and Alba flora, besides Muscats and Malmseys ripened by age, to which medals were awarded. The majority of the red wines resembled those of the South of France, and were deep in colour, fruity, and highly spirituous, while the white were generally more delicate, dry, and slightly acidulous. From the Canary Isles there were only a couple of exhibitors of the once famous wines to which such frequent reference is made by the old dramatists, and which inspired Howell, the letter writer, to pen his well-known rhapsody in their praise. These were Davidson and Co., of Santa Cruz, who carried off a medal for progress, and Don Perdigen, of Orotava, both of whom sent a few samples, the best of which might have been mistaken for Madeiras, while others had evidently been made up to resemble Sherry. There was also some sweet Malmsey, but none of the ancient *vino secco* (the veritable sack), so termed from the grapes of the Vidogne species, from which the wine was made being previously dried, and not as commonly supposed because the wine itself was dry, for all the allusions to it would seem to point to its having been a sweet wine. Prior to the ravages of the vine disease the Canary Isles used to produce 2,500,000 gallons of wine, but since that period the yield has been considerably reduced, and in 1866 the total exports were only 92,000 gallons, about one-sixth of which or 15,000 gallons, valued at 2,700*l.*, were for England. Three years later the exports of wine had fallen to 28,000 gallons, of which England took merely 7,500 gallons, or half of what it did in 1866, while rather more than this quantity went to Germany. In place of wine the Canary Isles have taken to producing cochineal, and according to the last returns their annual exports of this commodity were as much as 842,921*l.* against merely 5,945*l.* received for exports of wine.

There were 249 exhibitors of wine from Spain, contributing 546 samples, and the rewards which they secured comprised a Diploma of Honour given to the Catalan Agricultural Institute at San Isidro, 27 medals for progress, and 79 medals for merit, honourable mention being further made of 62 exhibitors.

THE WINES OF ITALY.

I.—*Wines of the North.*

Italy with all her natural advantages has not yet learnt how to produce a really fine wine. Apart from a limited number of special growths, such as the Barolo of Piedmont, the Chianti of Tuscany, the Orvietto and Vino dell' Est of the Roman States, the Lacryma Christi of Naples, and the Zucco of Cosenza, almost all her wines lack flavour and bouquet. They are invariably rich in colour, and those of the South are remarkably alcoholic, but these qualities, desirable as they may be, fail to atone for the want of agreeable taste and aroma. It is but just to add, however, that of late years considerable progress has been made in the right direction. Œnological societies have been founded in different provinces, and are actively engaged in effecting reforms in the various branches of viticulture and vinification. Foreigners have also settled themselves in favourable situations, and are cultivating the vine with all the intelligent care pursued in the best wine districts of France. Judging from the samples displayed at Vienna the principal cause of the mediocrity of the Italian wines arises from their imperfect fermentation, which renders them liable to become muddy or turn into aceteous acid.

Piedmont.—The finest North Italian wines exhibited at Vienna came from the Piedmontese provinces of Alessandria, Cuneo, and Genoa, the growth especially selected for distinction being the popular Barolo, a red wine produced from the Nebiolo grape, and resembling in flavour the best *crûs* of the Côtes du Rhône. It is, moreover, of about the same alcoholic strength, averaging from 23 to 24 degrees of proof spirit, and, like them, requires to be kept for at least a couple of years, and is at its best after it has passed its first decade. Of the numerous samples submitted to the jury at Vienna, those displayed by the Alessandria and Sanfrè Œnological Societies, and by Signor Fissori of Bra, proved to be the finest, and secured medals for progress, medals for merit being given to Signor L. Fontana of Alba and the Marquis Alfieri di Sostegno of Turin, while honourable mention was made of several other exhibitors. Some good samples of Barolo and of the inferior growths known as Nebiolo and Barbera, the latter a peculiarly flavoured full-bodied rough wine, came from the little city of Asti, in the neighbourhood of which the cultivation of the vine has always been strenuously pursued in spite of the ravages of the Crittogama, and the importance of whose produce and trade has led to the generic name of Vini d'Asti being commonly given to the Piedmontese growths. Samples of the ordinary Asti table wines of an agreeable flavour and moderate alcoholic strength were displayed by the Œnological Society of that locality, one of the first of its kind established in Italy. Honourable mention was made of these samples and of some so-called Nebiolo, which further obtained a medal for merit for one of its exhibitors.

The dark full-bodied Grignolino wine, named after the particular species of grape, largely grown in the vineyards of Asteran and Monferrato, from which it is produced, and which has some affinity with the Kadárka of Hungary, and the Cabernet of the Gironde, possesses the remarkable quality of not keeping for any length of time unless largely diluted with water. Of the numerous samples sent to Vienna those displayed by Signor Manacorda of Casale Monferrato were awarded a medal for merit, but none of the others were judged worthy of recognition.

From Count di Sambuy's estate on the famous battle-field of Marengo came several varieties of wine placed *hors concours* by their exhibitor's position on the jury. Some of them were the produce of imported Cabernet, Pineau, and Aramon vines, others designated cy the titles of Neirano, Castel Ceriolo, and Valmagra, being made from native grapes. These wines proved to be less alcoholic than Barolo, while in taste they were like some of the Mâconnais growths only more intimately blended. They were already of fine quality in their third or fourth year, still, like the Piedmontese wines generally, they are at their best when from 10 to 12 years old.

From the vicinity of Genoa la Superba came some samples of Sestri Levante, a refreshing white wine, for which, and some choice Chiavari growths, Signor A. Boltire secured a medal for progress. Genoa, moreover, sent some specimens of Sardinian produce, notably Nasco, a highly alcoholic wine, which requires keeping some three years before being drunk, and Vernaccio from the province of Cagliari and district of Oristano, a light straw-colour wine with a taste akin to Riesling. Malvasia and Muscat are produced largely in Sardinia, as well as Campidano, a fair ordinary red wine with considerable body, the price of which varies from 9*d.* to 14*d.* per gallon.

Lombardy.—The samples of wine from the pebbly Lombardian plains were few in number and poor in quality. A single medal for merit was awarded to Signori Ricardi Fratelli for some Corvino and Malvasia grown in the vicinity of Brescia, whence also came samples of Erbametto and

Bordagno wines. Bergamo and Mantua each sent samples of their common red *vini da pasto,* a solitary specimen of white wine coming from Casalmaggiore in the vicinity of Cremona, the city of violins. Honourable mention was made of simply one out of many red growths from Pavia whence Francis I. indited his celebrated mot "Tout est perdu fors l'honneur," and of a Spanna wine from Como, once Pliny's favourite place of sojourn. From Chiavenna, to the north of lake Como, came some excellent Sassella which secured a medal for merit for its exhibitor Signor C. Faceti, but which is scarcely a Lombardian wine, being produced in the rugged sub-alpine Tellina valley, which up to the middle of the 17th century was a political dependency of the Swiss canton of the Grisons.

Venetia.—There were but few samples of Venetian wines and of these the ordinary Corvini grown in the plains proved remarkably poor, due doubtless to the half wild system of cultivation prevalent; lacking alike colour, aroma, saccharine, and alcohol, but possessing a pronounced bitter flavour betraying the juice of the thick grape stalks. The better specimens came from the Valpolicello in the vicinity of Verona and were the produce of the well known Negrara grape. They proved to be well made table wines with less *finesse* than certain Tuscan growths and of moderate alcoholic strength. This Valpolicello wine requires to be kept for two or three years before being drunk, and is at its best when in its eighth or tenth year. Honourable mention was made of a collection of samples sent by various growers of the locality.

Besides various bitter red and white *vins ordinaires* Treviso sent a few specimens of Prosecco which received honourable mention, while from Udine, not far from the Austrian frontier, came specimens of the white wines of Ribolla and Cividino, with the same Piccolit one had become familiar with when tasting the growths of Görz and Carniola. Some of the best Venetian wine was exhibited by Signor Melichi of Mogliano, who was awarded a medal for merit. From the oases of Vicenza and Conegliano, shut in on all sides by mountains, and therefore less exposed to cutting winds than the open plains, came various samples of wines somewhat less acid than the majority of those exposed, and of which honourable mention was made. In these localities it would appear that really excellent wine might be produced, the temperature being both high and equable and the vineyards enjoying a sufficiency of moisture most conducive to the aroma of the wine. These growths are of considerable reputation in Venetia and secure a higher price than the produce of the plains.

The samples from the so-called Reggio Æmilia, which comprises the former duchies of Modena and Parma, were still fewer in number than either those of Lombardy or Venetia, and none called for any higher award than honourable mention, which was made of a gold colour syrupy Trebbiano, some Muscats of Piacenza, and the white Ruffino growths of Sciandiano.

From Bologna came specimens of white Montu and Alconzo contributed by the Marquis Tanari, while Sarsina sent various red *vini da pasto*, and Cesena, Forli, and Rimini, samples of their San Giovese and Albano growths, which secured among them one medal for merit and honourable mention in a couple of instances.

II.—*Wines of the Centre.*

Tuscany, &c.—Some of the finest of the Italian wines exhibited at Vienna came from that continuous vineyard and olive ground, the sunny province of Tuscany, famous alike for its fragrant Chianti and Pomino, its Artimino and Carmignano growths, its Verdea, the favourite wine of Frederick the Great, and more especially for its luscious Montepulciano, of which a couple of centuries ago Redi sung—

> "Montepulciano d' ogni vino è il Rè!"

This latter wine, which when at its best is of a brilliant purple colour with a luscious aromatic spirituous flavour, its sweetness being moreover tempered by an agreeable sharpness and astringency, was only represented at Vienna by a single sample possessing none of these qualities in any marked degree, but of a mediocrity which cast a serious doubt upon the impartiality of Redi's judgment.

The best specimens of Tuscan wine submitted to the jury were the Chianti of Baron Ricasoli, from his Brolio vineyards in the vicinity of Sienna, and to whom a medal for progress was awarded. In this part of Italy as elsewhere there is a great tendency to extend to a whole region the name of the produce of some favoured locality, and in the same manner as almost every glass of good wine in Piedmont is described as Barolo, so every flask of a superior kind in the ancient duchy of the Medici goes by the name of Chianti. The veritable wine, which possesses remarkable *finesse* and an agreeable subacidity, is not unlike the best Beaujolais growths with, however, more colour, body, and force. Chianti is in its prime at its fifth or sixth year, but can be drunk when from two to three years old.

From the vicinity of Florence came various samples of *vini da pasto* often disagreeably rough, but with considerable freshness and fine deep colour, besides such varieties as red Poggiosecco, white Nippozzono, Altomino, and Castelruggero, specimens of the two last-named receiving honourable mention, Marquis Albizzi Degli of Pelago obtained a medal for progress for his samples of Pomino, a fine wine of the Chianti type, equally spirituous and reaching maturity at about the same epoch. Poggio Vittorio near Florence as well as San Lucar and Perugia sent specimens of Italian straw-wine, mostly insipidly sweet, although one sample forwarded by Signor Baccini secured a medal for merit.

The Province of Ancona was represented by eight or 10 exhibits, comprising Monticarroto, San Giovese, Lacryma, Montanino, Santo, and Balsamina wines of no particular character, while Arezzo sent some superior black, red, and white *vini da pasto* for which a couple of medals for merit were given.

The samples of the Campanian wines were poor in quality, but extremely alcoholic, frequently containing as much as 30 per cent. of proof spirit. It was difficult to imagine either of them the famous Vino dell' Est, which Bishop Johann Fugger found so good a vintage of at Montefiascone, that he deliberately drank himself to death with it, and one failed moreover to recognise the well-known faint coloured and somewhat sweetish growths of the Orvietto vineyards. The common rough *vino da pasto* grown on the hills round Rome, believed by some formerly to have produced the far famed Falernian, Setinum, Albanum, and Cæcuban wines, was found to be almost unworthy of recognition.

III.—*Wines of the South.*

Naples.—At the head of the South Italian wines one unquestionably has to place the far famed Lacryma Christi, the produce of the loose volcanic soil of Mount Vesuvius, an exceedingly luscious wine of refreshing flavour and ordinarily of a rich red colour, but of which white and even sparkling varieties are produced. Samples of the whole were exhibited at Vienna, where the wine growers and merchants of the district also displayed examples of so-called Falerno, the well-known Capri, a fresh fragrant sub-acidulous wine of a pale primrose colour, with other fruity and pleasant tasting growths, both sweet and dry, from the remaining islands in the Bay of Naples, and along the banks of Lake Averno. The finest samples of both Lacryma Christi and Capri were those displayed by Signor Guiseppe Scala of Resina, to whom a medal for progress was awarded, honourable mention being made of several other exhibitors.

From the Neapolitan province of Bari came samples of Tauraso, Troia, Auricano, Primaticcio, Sagarese, and Aleatico wines, the last named sweet variety being recognised by honourable mention. Gallipoli and Taranto also sent samples of their growths, reputed to be the strongest of the Neapolitan vintages, while Aquila was represented by specimens of her muscats, and Avellino by examples of her Grotoletto and Sananervi wines, Salerno displaying its bottles of Fiorignano and Montevino, and Teramo its flasks of Gransasso. Beyond proving highly spirituous these samples exhibited no particular merits, and met with no special recognition; a medal for progress however was awarded the Duc d'Aumale for his full flavoured Zucco wine vintaged on his estate at Cosenza.

Sicily.—Sicily contributed numerous samples of what the French term *vins de dessert,* particularly of Marsala, the most celebrated growth of the island. The Sicilians were, however, unfortunate in their sweet dessert wines, in many of which a second fermentation had set in, while others had become muddy and acquired an extraneous flavour owing probably to the added syrups having been badly prepared. In a few samples spite of their excessive sweetness there was an acidity occasionally akin to vinegar, although it was usually mere vinous acid arising most likely from the ripening of the grapes having been impeded by drought.

The finest Marsala was displayed by Signor M. Romeo of Catania, to whom a medal for progress was awarded. It was of great softness and Madeira like flavour, and had been only moderately if at all fortified. Messrs. Ingham and Withaker sent what they termed "English" and "Italian" Marsala, the former being of course extremely alcoholic, and the latter obtaining them a medal for merit. Similar medals were given to Signori Ignatius Florio, Platamore fratelli, and Rosso and Scammacia, honourable mention being made of three other exhibitors. The Sherry-like flavour and aroma of the Marsala wines, which require it is pretended 20 or 30 years to reach complete maturity, when they become very soft and refined in flavour, is doubtless due to the similarity of the soil from which they are produced to that of the Jerez vineyards, both being a compound of carbonate of lime and argil mingled with oxide of iron. The belief that the soil is volcanic is erroneous, as no sulphur is to be found within 100 miles of where Marsala is produced. The alcoholic strength of the natural wine is very great, ranging it is said as high as from 30° to 35° of proof spirit. Red Marsala, of which there were a few samples displayed at Vienna, proved to be a stout dry wine with a strong and somewhat astringent flavour. The average price of new Marsala ready for export may be estimated at 4*s.* per gallon.

From the volcanic slopes of Mount Etna came some capital white Sicilian wine which secured for its exhibitor, Princess Biscari, a medal for merit, but one looked in vain for samples of the famed Terre forte from the vineyards of the Benedictine monks in the same neighbourhood, and which is the most alcoholic wine produced in the eastern district of Sicily, indicating as it does 29·9 degrees of proof spirit. There were numerous samples of Malvasia and Muscat, the former, which is not equal to that of San Lucar, may be drunk when two years old, but reaches maturity at 20 or 30. The best Malmsey was exhibited by Signor P. de Pasquale of Messina, who received a medal for progress for it, a medal for merit being given to Signor Ciaculli of Palermo for his sample of Muscat, a *vin de liqueur* of great *finesse*, more spirituous and less syrupy than the famous growths of Frontignan and which contains on the average 25 degrees of proof spirit.

In addition to these awards a medal for progress was given to Signori Cassola, for some samples of red and white Syracuse wines, a medal for merit being also bestowed on Senator Moscuzza for scarcely inferior specimens, and honourable mention made of the so called San Sidero Amareno, Senavese, Villa Salto, and Albanello growths—the last-named rather fiery and with somewhat of a Sherry flavour. Some of the best Sicilian wines were exposed by an Englishman, Mr. Rainford, who has taken to wine growing on the banks of the Alcantara, and sent samples of a red wine from Mount Matrissa, the products of whose vineyards were extolled alike by Virgil and by Pliny. The wine which was of a tawny tint was fresh tasting and yet with a decided tonical flavour. Santa Venera proved more brilliant in colour, had a soft and pleasant yet decided spirituous flavour, and was altogether not unlike a thin Port. The crust deposited was considerable. The Nacarella, a white variety, amber coloured, with a slightly sharp, sweet, and subbitter flavour combined with a certain rich fullness of body, was evidently a wine of some rank. The Cavallaro of a deeper amber tint was both dry and spirituous, while the Albanello was a little sweet and sharp and less alcoholic, and had a marked etherous flavour. Of the Alcantara produced on the banks of the river of that name and on the site of the Chalcidean colony of Naxos, one sample was amber coloured, spirituous, and with a pungent nutty flavour, while another of a deeper tint was far mellower and had a slight sweet-bitter after taste. The variety known as

Latte d'Oro belied its name, for it had none of the brilliancy of gold, being in fact quite cloudy. It was, moreover, rather sweet and had a perceptible etherous flavour.

The manner of cultivating the vine differs to some extent in the various provinces of Italy, although the system of high training may be said to prevail. In Lombardy trellis work and poles are alike used for the support of the vines, while in Venetia the plants are almost invariably trained to trees such as the wild cherry, willow, and hazel which are planted in lozenge or quincunx fashion for the purpose. In Tuscany again the vines will be found climbing up the trees, which on level ground are planted 25 feet and on the hills some 15 feet apart. In the late Roman States it is the custom to train the plants upon cane poles placed at regular distances from each other in long lines and often interlaced into a sort of trellis work; while near the houses one finds the invariable arbours or pergolas covered with clustering fruit. On the high grounds the vines are planted in terraces with wheat crops sown in between. Around Naples the trellis work, formed of tall stakes with cross pieces of cane, is very high and here the vine growers never vintage until the autumnal rains have swelled the fruit, assigning as reason that the wine would spoil if they did so. In some parts of the south where the system of training to trees prevails great care is taken to keep the vines well shaded, while in the north the trees are pruned to let in alike air and sunshine. In isolated instances the French systems of training and cultivating the vine have been adopted, but have not been found to answer in warm situations. Often enough in Italy the vines are well attended to, and they certainly yield a fabulous amount of fruit, but the system of vinification is remarkably careless. Ordinarily no pains are taken with the selection or sorting of the grapes so as to obtain different qualities of wine, but red and white, rotten and unripe, are commonly pressed together and too often are only very imperfectly fermented.

The alcoholic strength of the different Italian wines of which analyses are on record is as follows—the figures given indicating the per-centage of proof spirit. Of the Piedmont wines the Asti, Marengo, and Valmagra varieties average 22, Barolo ranges from 23 to 24, the *vins ordinaires* frequently indicating only half this strength, while such white wines as Naseo and Cannonao show as much as 28. The Lombardy red wines average 19, and the white 22; Valpolicella containing about 20. The well-known Tuscan growths, Chianti and Pomino, range from 22 to 24; Vino Nobile has scarcely 18; and the white varieties having 28 and upwards. Some of the Naples red wines indicate merely 15½; Lacryma Christi averages 19; Gragnano, 21; and Taranto, 24; while of the white varieties the weaker kinds have as little as 12, white Lacryma Christi shows as much as 25. Among the Sicilian wines some Marsala, understood to be unfortified, contained upwards of 30; Santa Venere has 29½; and the Muscats and the Malmseys range from 26 to 29.

The annual produce of wine in Italy is estimated at 770,000,000 gallons, almost the whole of which is consumed in the country. The average quantity exported is 5,250,000 gallons, valued at between 5,000,000*l.* and 6,000,000*l.* although in 1867 it rose to upwards of 6,500,000 gallons, and in 1872 was even more than 10,000,000 gallons. The wines are relatively dear in price, especially at the present moment, the vintage of 1878 having given an exceptionally small yield. Thus of the superior Piedmontese growths Barolo fetches 4*s.* 4*d.* per gallon at Genoa, the wines of Asti 4*s.* per gallon, and the Marengo *crûs* of Count di Sambuy 3*s.* 8*d.* per gallon at the same port. The price of the Grignolino wines is about 2*s.* 9*d.* per gallon at Asti and 2*s.* 2*d.* or 2*s.* 3*d.* per gallon at the place of production; that of the Barbera vintages about 2*s.* 9*d.* per gallon at Asti and 2*s.* 4*d.* per gallon at the vineyard. Strongly coloured common Italian wine may be obtained at the former locality at from 2*s.* to 2*s.* 3*d.* per gallon. The value of the Venetian Valpolicello wines is 4*s.* 4*d.* per gallon, Tuscan Chianti fetching 5*s.* 2*d.* per gallon at Leghorn, and Pomino being a trifle dearer. With regard to the Sicilian wines the average price of new Marsala is 3*s.* 8*d.* per gallon, of fine Malvasia 5*s.* 6*d.*, and of Muscat about 6*s.* 6*d.* per gallon.

The 259 exhibitors of wine from Italy, representing 43 out of its 59 provinces, contributed 429 kinds of wines in all, comprising 288 samples of red, 117 of white, 76 of dessert, and 11 of sparkling wines. Of the specimens sent from Piedmont and Sicily more than half were of acknowledged quality, whereas of those from Lombardy and the so-called Æmilia fully half were utterly worthless, and even the remainder rarely showed qualities entitling their exhibitors to the reward of a medal. Though the comparatively small number of samples may warrant no decisive conclusion as to the general condition of wine production in Italy, one was still enabled to see that in certain provinces the systems of viticulture and vinification were very defective. Above all the Italians showed they had much to learn with regard to sparkling wines; Asti being strong, sweetish, and unstable, others either too sweet or too acidulous, and others again being both sweet and acidulous at the same time, besides which the flavour of several was decidedly not pure.

The rewards for Italian wines comprised 11 medals for progress, 24 medals for merit, and honourable mention in 62 instances.

THE WINES OF GREECE.

Familiar though I was with the excellent Greek wines introduced into England by Mr. J. L. Denman, whose persistent efforts in the cause of pure *versus* fortified wine are well known, I anticipated endless pleasant surprises when assisting at the tasting of the general vinous products of the Hellenic kingdom. Unfortunately, however, neither the exhibitors nor the samples were so numerous as I had expected, besides which many specimens had evidently suffered from the voyage, or more probably the high temperature to which they had been exposed, while others proved to be the strongly resined wines of the country prepared for home consumption, and which Greek vine growers have long since become convinced it is useless for them to export to the nations of the West. With the excessive heat which prevails in Greece during the vintage season, the European system of pressing the grapes and fermenting the *must* can only be carried out with the greatest care. The white wines have to be pressed as rapidly as possible, and in making the red the skins require to be kept beneath the surface of the *must* by a special apparatus, and in both instances it is requisite to exclude the air as far as possible to prevent the formation of acetic acid. The admission of air to the *must* during fermentation, which is generally attended with advantageous results in northern climates, appears to have a directly opposite effect in warmer ones, where during the brief time occupied in treading and pressing the grapes the atmospheric changes regarded as necessary seem to succeed in producing themselves.

To save what they consider needless care and trouble, and to ensure the wine keeping when stored in cellars level with the ground, with the temperature ranging from 80 to 100° Fahrenheit, many of the Greek wine growers still continue to resin their wines, thereby rendering them suitable only for home consumption. They justify this use of resin on purely hygienic grounds, firstly as a protective against malaria fever, and secondly as a corrective of the lime which the ordinary water contains an excess of. Large quantities of unresined wines are, however, made for export, especially in the islands of Corfu, Cephalonia, Zante, and, above all, Santorin, and also in the peninsula of the Morea.

At their best, that is, matured by moderate age, the Greek wines are unequalled save by certain exceptional *grands crûs.* The red varieties may not have the rare exquisite bouquet and velvety softness of Margaux and Latour, or the roundness, and spite of their greater alcoholicity, the substance, so to speak, of Romanée or Corton; still they beat an average Burgundy, and, besides being more wholesome, have a more genuine vinous flavour than any excepting the finest natural Ports. Putting aside the entire class of sweet wines, which are for sipping and not for drinking, where is the purely dry white variety than can be said to excel St. Elie when in its prime? Pale as the palest of natural Sherries, owing to the grapes from which it is made being shaded by their leaves, and deprived of the fiery influence of the sun's rays, St. Elie has a peculiar and original flavour of its own, arising, no doubt, from the volcanic nature of the soil whence it comes. It rivals the best Amontillado, for more than any other Greek wine it is the one which develops the prized etherous flavour and bouquet, besides preserving an agreeable freshness of taste in which all Sherries are invariably deficient. It is more refined and delicate, more *spirituel* than any of the Hungarian growths, and having more dryness and character is better adapted for a dinner wine than the finest Sauternes.

Athens sent both red and white wines to Vienna, and one sample of the former from Mount Parnassus, 16 years old, was found so well preserved, without recourse having been had to resin, that honourable mention was made of it. Among the samples of wines grown in the plain surrounding Mount Hymettus, renowned for its honey, which brings out the flavour so marvellously of the white wines of the locality, pre-eminence must be given to the red Hymettus of a rich ruby colour and genuine Burgundy flavour, although without the velvety softness, and the volume of the grand growths of the Côte d'Or, while the white variety with its fresh acidulous flavour recalls more nearly a spirituous Grave than any other wine one can call to mind. From Mount Olympus came the dry and full-flavoured red wine of Noussa of a fine but not particularly high colour, and with a decided fruity bouquet and abundance of vinosity, due, however, to perfect fermentation, and not to adventitious alcohol, for following the good traditions of old the modern Greeks never fortify their wines.

Athens further sent red Kephisia with a pleasant sub-bitter taste, which moderates with age when a decided bouquet develops itself. The white variety, slightly more spirituous than the red, is not easily characterised, except by describing it as marvellously delicate and dry, and having a slight tonical flavour. All these wines were made on the French system, and as carefully as the best products of the Gironde, and their merits were recognised by the award to one Athens exhibitor of a medal for progress, to another of a medal for merit, two others having honourable mention made of their samples.

From the Morea, Patras, Nauplia, and Corinth contributed samples of red and white wine from the Corinthiaca or currant grape, strong, acidulous, and high flavoured and requiring moderate age to temper it. Those from Nauplia were the best and received honourable mention. In the Morean peninsula these small pipless grapes are principally cultivated, and on being dried find their way into the market as currants. So long as the weather favours their drying they are disposed of in this form to the greatest advantage, but whenever rain chances to set in and renders the drying of them impracticable —the operation being carried on in the open air—the currants either cannot be sold or else realise scarcely anything. Owing to this the inhabitants some years ago commenced to convert them into wine, and the Achaean Vine Culture Company recently established at Patras contemplates producing these Corinth wines in great abundance. From examinations and experiments carried out upon a large scale in Greece by Professor Nessler, of Carlsruhe, it appears certain that considerable quantities of wine of good quality and low price adapted to the export market can be produced. The juice of the currant grapes was found to contain from 24 to 29 per cent. of sugar, and in considering whether the wines were likely to remain sweet, the influence of great drought during the ripening of the grapes upon their saccharine and acid contents was carefully estimated, and it is believed will necessitate the production of full-bodied and decidedly acidulous wines, for as is well known to those who have studied the subject, the ripeness of the fruit depends far more upon a due amount of moisture at the proper time, than on continual sunshine and a high degree of temperature.

The potent red wine known as Patras resembles both in colour and flavour highly spirituous natural Port, while the equally powerful white wine has the refreshing sharpness and some little of the flavour of certain growths of the Rhine, although its greater alcoholicity renders any comparison between them extremely difficult. Still and sparkling varieties of this wine were exhibited, as well as some sparkling wines from Kynouzia. Nauplia di Malvasia, which originally gave the name to the wine known as Malvasia, otherwise Malmsey, characterised by the Italians as "manna to the mouth and balsam to the brain," and subsequently reproduced in all the wine countries of the world, failed to send even a single specimen of the rich liqueur wine so called; Misistra, however, contributed samples of it and so did Patras, which sent with it several Muscats and a wine styled Mavrodaphne, a collection which secured for its exhibitor, M. Kipfel, a medal for merit. Another exhibitor from Calavyto, where the monks of the convent of Megaspileon store their wines in huge tuns, after the fashion of mediæval times, secured honourable mention for his products.

It was from the islands of the Archipelago, from Naxos, Andros, Syra, and above all Santorin that the finest Greek wines came. Naxos sent some sweetish red wines very pale in colour, due probably to a mixture of red and white grapes, Syra forwarding the brilliant full-bodied Como which resembles when young a fruity Port, while Santorin, the nest so to speak of the grand Greek *crûs*, contributed many of its finest growths—Santorin whose volcanic soil produces Bacchus wine, Santo wine, Night winé, and Calista wine, the extremes, it may be said, of sweetness and dryness, some as described by Edmond About yellow as gold, translucent as the topaz, and bright as the sun; others almost colourless as a summer moonbeam. Of the dry wines the one known as Thera has an abundance of natural spirit combined with a distinct yet delicate flavour suggestive of a dry Madeira, but the Santorin white wine *par excellence* is the dry, delicate, spirituous, fresh tasting and ambrosial St. Elie, known locally under the poetical designation of the wine of Night, from the vintage taking place after the sun has sunk to rest. Red Santorin which becomes topaz tinted with age has an indescribable vinous bouquet and a fine dry spirituous flavour, and imparts a generous glow, a calm inner warmth, by the aid of its own natural alcohol. Of the famous Bacchus wine, which Miss Bremer in her ecstacy while sipping on the spot, found to be of the taste of nectar and the colour of liquid gold, no samples came to Vienna, but we had the fragrant Vino Santo, a delicious Muscat wine of spirituous flavour and honey-like consistency made from grapes dried for a week and upwards in the sun, and of the same luscious character as the well known straw wines of Italy. There is a purple as well as a white variety of Vino Santo, and the island further produces a similar but less luscious wine known as Ambrosia. No sweet red wine in the world can compare with Lacryma Christi, and that from the island of Santorin equals its renowned Italian prototype. For the very interesting collection of Santorin wines exhibited by the commune of Thera a medal for merit was awarded.

With the exception of the hill of St. Elias the island of Santorin is mostly vineyard, and it is to the volcanic nature of its soil, which exercises so favourable an influence on the grape, that the Santorin wine owes its recognised excellence. The vines we are told are planted far apart, the precise distance being regulated by the quality, strength, and aridity of the ground, to allow of each stock being abundantly nourished and its roots freely developed. From the short and vigorous stems a certain number of shoots spread out and are trained in a crown-like form, causing the vines when in full foliage to resemble bushy shrubs of circular shape. The species of grape from which both red and white Santorin wines are principally made is the Assyrticon, while among other vines cultivated in the vineyards of Greece are the white and black Muscat, the Malvasia, the Greco, the Cipro, and the Corinthiaca.

From three of the Ionian islands, Corfu, Cephalonia, and Zante, came some light red and white wines with a collection of purple Muscats from the years 1854 to 1866 and some white Muscats of 1868 vintage. The Muscats, which were remarkably fine, secured a medal for progress for their exhibitor, M. Manzarinos of Cephalonia. Of the ordinary wines those from Zante were the best and received honourable mention. Some Epirus wines from the neighbouring continent were light and acidulous but will rarely keep beyond the first year. Ithaca sent samples of its olive oil, but not a single bottle of its fine red wine which is said to be of the Hermitage type.

The alcoholic strength of the higher class Greek wines is more uniform than that of the wines of any other country. St. Elie and Thera, which are the two most powerful, both contain 26 degrees of proof spirit, while the white wine lowest in the scale, namely Hymettus, contains upwards of 25. Of the red wines Santorin is the most potent, indicating as it does very nearly the 26 degrees, Como containing 24½, Patras 24, Hymettus 23½, and Kephesia 23. The sweet Vin Santo and Lacryma Christi simply range from 15½ to 17.

The total area over which the vine is cultivated in Greece is estimated at 123,550 acres, the annual produce of wine being calculated at 26,400,000 gallons. All I am able to report with regard to the prices of Greek wines *in loco* is that those produced in Attica, and which are principally prepared with resin to enable them to keep, sell on the spot at the rate of 1*s*. the gallon, and that the Corfu wines command a trifle more. In 1869 continental Greece exported wine valued at merely 12,500*l*., of which 2,500*l*. was shipped to Great Britain. In addition Corfu exported 300,000 gallons, but no record is available of the shipments of the higher class wines from the islands of the Archipelago. Considerable quantities of Greek *vins de liqueur* are exported to Turkey and Russia.

At Vienna there were merely 25 exhibitors of wine from Greece, whose samples comprised 36 varieties, and of whom 10 received rewards, two obtaining medals for progress, and two others medals for merit, while honourable mention was made of the remaining six.

THE WINES OF TURKEY AND ROUMANIA.

Although the samples of wine sent by Turkey to Vienna were comparatively few, they comprised besides specimens from the Turkish islands of the Archipelago, renowned in ages past for the luscious character of their various growths, examples from many of the European and Asiatic continental provinces, thus showing that regardless of the precepts of the Koran, the Sultan's subjects are largely devoting themselves to viticulture and vinification. Turkey ought to produce very good wines. The diversified nature of her soil and climate is eminently adapted to such a result; but unfortunately instead of adopting the improved European systems the country population prefer following in the beaten track of their ancestors, and retain the obnoxious custom of coating their wine vessels with resin and adding turpentine and mastic to the grape must. They maintain that the custom is a good one, and a preventive not against fever but consumption, which last may perhaps be true, still it is quite certain that the practice renders the wine excessively unpalatable to foreigners and undoubtedly checks its exportation. So strong in many of their wines is the taste and odour of resin and the various ethereal oils which it contains that they are scarcely recognisable as wines at all; although the less tainted may be made passably agreeable by diluting them with water. It is but just to add however that in spite of the obnoxious resinous flavour more or less degree apparent in the Turkish samples, the jury were enabled to discern a certain intrinsic value in a considerable number of them.

Among the specimens from Turkey in Europe were some examples of wines vintaged in the vicinity of Constantinople, notably syrupy white *vins cuits*, to one exhibitor of which a medal for merit was awarded, while of two others honourable mention was made, the latter recognition being also accorded to some red growths produced on the banks of the Golden Horn. From Adrianople came various samples with unpronounceable names less tainted than usual with the obnoxious resinous flavour and similar to good Roussillon although varying very much in character. The best of these were displayed by an exhibitor named Kevor, to whom a medal for progress was given, honourable mention being made of some inferior qualities. Salonica likewise sent numerous specimens of Macedonian vintages, both red and white, for which two exhibitors secured respectively medals for progress and merit, while from Janina in Albania came some syrupy white wines of which honourable mention was made.

The larger number of awards given for Turkish wines were secured, however, by exhibitors from the islands of the Archipelago, of which Cyprus yielded in ages past a growth renowned above all others, and which six centuries ago was dignified by Philip Augustus with the fanciful title of Pope of wines. The finer specimens of Cyprus were those vintaged in the vicinity of Paphos, near the ancient Commandery of the Knights of the Temple and of Malta, destroyed by the troops of Sultan Selim II. when the latter wrested the island from the Venetian Republic to make himself master of its vinous treasures. The younger samples of this naturally rich and spirituous wine proved to be of a bright topaz colour, while the older vintages were much darker, viscous, thick, and strong, the whole of them being far more like a liqueur than a wine. Their flavour was alike aromatic and resinous, their peculiar bouquet, recalling the odour of bitter almonds, being due to the practice of suspending spices and other aromatic substances enclosed in a bag in the amphoral shaped jars in which it is the custom to keep the wine. In addition to the wine of the Commanderie, for samples of which an exhibitor named Jorgaki secured a medal for merit, Cyprus also sent specimens of her excessively sweet Muscats. The ordinary Cyprus growths are remarkably heady, and several samples were so strongly tainted with the obnoxious resinous flavour as to be undrinkable unless diluted with water. During their first year these wines are merely so much sweet must, and at the expiration of this time usually pass into the acid or alcoholic stage, but are not considered fit to drink until they are four or five years old, by which time they have exchanged the pale red colour of their youth for a faint tawny tinge. The finer varieties go on improving the longer they are kept, and eventually become quite balsamic in character, but not until they have passed their fifth decade. They are produced largely in the vineyard of Oinodos which comprises the two declivities of a chain of calcareous hills, one of which is cultivated by the Christians and the other by the Mussulmans.

The soil—a compound of chalk, black earth, and flinty stones with here and there a vein of ochre running in between—has doubtless much to do with the remarkable natural qualities of the Cyprus wines, some of the ordinary varieties of which would form a desirable addition to our dinner tables were it not for the disagreeable practice of impregnating them with tar. The vines, of the variety known as the Cipro and peculiar to the island, are remarkable for the large size and luscious sweetness of the dark blue acorn shaped grapes they yield. In former times wine was only made openly by the Christian fraction of the population, the Mussulmans preparing theirs in secret and selling it under the name of Staphidia; to-day, however, the followers of both creeds unreservedly devote themselves to viticulture and vinification. Production, however, is largely interfered with by the Government taxing the wine growers nominally 20 but in reality nearly 30 per cent. During the last century an attempt was made to introduce French casks into the vineyards, but it failed, and the wine is still fermented and matured in cone-shaped vessels holding rather more than two gallons each, and which have to be half buried in the ground owing to their amphoræ shaped base. In 1869 Cyprus exported 530,000 gallons of common wine to Turkey and 13,400 gallons of the wine of the Commanderie, valued merely at 1,210*l.*, to Austria, Italy, and France.

The island of Crete or Candia, which in antiquity produced the luscious Passum wine extolled by Martial, and the Pramnian Malvasia praised by Diodorus, forwarded several samples to Vienna, of which those sent by the Government authorities were judged worthy a medal for merit, while two other exhibitors had honourable mention made of their specimens. Candia formerly enjoyed a high reputation for her Malmseys, the finest of which were produced at Arcadi. Now-a-days her growths are principally red, and, like those of Santorin and Smyrna, both dry and sweet, possessing great vinosity and ripening rapidly. A small quantity of Muscat is produced in various parts of the island of excellent flavour, but too delicate to support a sea voyage. Were the Cretan wines better made they might become again, as they were under the Venetian domination, one of the principal exports of the islands; at present they are subjected to a liberal admixture of gypsum which in a powdered form is trodden in with the grapes in the belief that it tends to preserve the wine. That produced at Agios Myron, and found by the jury to be the finer growth, fetches from 1*s.* to 1*s.* 6*d.* per gallon when bought wholesale from the grower; while the inferior vintages of Kissamos and Canea are valued at about one-third of this amount.

Honourable mention was made of two sets of samples from the island of Rhodes where some of the grapes attain the size of Damascene plums, which they resemble in colour, while the famous Samian wine which Byron in some well-known lines continually calls for the bowl to be filled with, proved to be a luscious Muscat of superior character, which secured a medal for progress for Mark Jorgaki and Co., and a medal for merit for another exhibitor. Scio sent samples of its wine, praised 1,800 years ago by Pliny and Strabo, and it was some satisfaction to find that one specimen of this once famous *crû* was really deserving of a medal for merit. Neither the wines of the isle of Cos, nor those of the diminutive rocky and barren islet of Tenedos near the mouth of the Dardanelles, famed for its red Muscats, and which also produces common red wine in abundance, received any recognition, but a medal for merit was given for some samples from Mitylene, and the Imperial Government of the Isles received a medal for progress for its collective exhibition of the principal growths of the various insular dependencies of the Ottoman empire.

The samples from Turkey in Asia were somewhat numerous, and comprised, besides white wines from Smyrna, which obtained a medal for progress, and amongst which were several rich Muscadines, various growths from Brussa and Diarbekir in the interior of Asia Minor, together with specimens from the vicinity of Jerusalem, and different vintages from the slopes of Mount Lebanon, fancifully termed Vin doux Rosa and Vino d'Oro, the former sweet and rose-tinted, as its name implies, the latter a bright-coloured strong-flavoured high dry wine. These Lebanon wines are made in considerable quantities, and it will be remembered how Kinglake, in Eothen, on asking the monks of the convent where he lodged which was the principal sight of the city hallowed by the sojourn and adventures of St. Paul, was immediately conducted to the convent cellars, and called upon to admire the store of vinous treasures with which their dark recesses were filled. It was the monastery of Miko, however, in the vicinity of Damascus, that sent to Vienna the best specimens of the wines of Mount Lebanon, and had a medal for merit awarded for them. In the Lebanon vineyards no kind of supports are used for the vines, which yielding grapes as large as prunes are nevertheless allowed to creep carelessly along the ground.

I have no information respecting the vineyard area in the various provinces of the Ottoman empire, but its total produce is estimated at 55,000,000 gallons of wine annually. There were 50 exhibitors of Turkish wines, consisting of 91 different samples. The rewards comprised 6 medals for progress, and 10 medals for merit, in addition to which 19 exhibitors obtained honourable mention.

Roumania.—The Roumanian wines were tasted at Vienna under very unfavourable circumstances, second fermentation having set in with a large number of samples, while of those that remained sound the majority were found to be very weak and poor in quality, some of them exhibiting actual sourness, muddiness, a peppery flavour, a sickly kind of odour, and other signs of negligent vinification, besides being occasionally impregnated with tar, which rendered them still more disagreeable to the palate. The means employed to prevent second fermentation appear to be most inefficient, merely retarding it for a short period, and tending to increase its violence when it eventually breaks forth. The only wine of any delicacy was a Croznovano of 1868, for which a medal for merit was awarded, a similar recognition being given for a red growth of passable flavour vintaged in 1866 from the grape of the well-known Vigne de Monsieur. There were 28 exhibitors, contributing among them 43 specimens, and besides the two who obtained medals six had honourable mention made of their samples.

Most of the Roumanian wines are produced on the southern slopes of the Carpathians, only a small quantity being vintaged on the banks of the Danube. The vineyards supposed to yield the best growths are those of Cotnari in the district of Tassi and Dragasani in that of Valias. The area of vineland is estimated at 247,000 acres, the annual produce averaging 22,000,000 gallons of wine.

THE WINES OF THE UNITED STATES OF AMERICA.

The samples of American wines exhibited at Vienna were not remarkably varied, still they enabled one to form a fair estimate of the produce of a land which is destined to become, like Australia, one of the great wine-producing regions of the world. There were merely 17 exhibitors, who, however, contributed among them as many as 82 specimens. Of four medals for progress which were awarded, one was secured by Messrs. M. Werk and Sons of Cincinnati; the second by the Pleasant Valley Wine Company of Hammondsport, New York; the third by Messrs. Eberhart and Lachmann of San Francisco; and the fourth by the Buena Vista Vinicultural Society. Of the three medals given for merit two were received by New York firms, Messrs. Ellis and Curtis and Messrs. G. Groezinger, Ruyter, and Co., the remaining one being allotted to Messrs. Poeschel and Scherer of Hermann, Missouri. Two other exhibitors received honourable mention. It is but just to add that the samples sent by the American Wine Company of St. Louis, Missouri, had been placed *hors concours*.

Of the various wines submitted to the jury a marked difference was observed between those vintaged in California and those produced in other States, a circumstance due to the fact that European vines are almost exclusively cultivated in the former province, while in the Missouri, Ohio, New York, and other States, the indigenous varieties alone are grown. Of the different Californian growths, known under the names of Angelico, Aliso, Porto, &c., the best were those of Messrs. Eberhart and Lachmann, to whom, as already mentioned, a medal for progress was awarded. This firm displayed some capital Riesling wine, not unlike the original Rhenish growth, although by no means equal to the finer European varieties, while their Gutedel, sweet and dry Muscatel, and so-called Tokay and Mountain wines, were carefully made and of fair average quality. The Californian Aliso proved to be a white wine with considerable body, and in taste not unlike an inferior Barsac; while some so-called sweet grape wine might have been taken for one of the light, brisk, and delicate growths of the Jura.

Of the wines from Ohio, Iowa, Missouri, Mississippi, and New York, which were the only States besides California that exhibited at Vienna, those produced from varieties of the indigenous Labrusca vines were all more or less tainted with the peculiar musky or foxy flavour inherent in those plants, and which is so displeasing to the European palate. The Catawbas, still largely produced in spite of that vine's liability to rot or mildew, and which Longfellow in his well-known song has described as "so dulcet, delicious, and dreamy," were of three tints, colourless, straw colour, and rose colour, according to their age and to the treatment the grapes had undergone. In taste they were not unlike certain wines of the Rhine, but fuller to the palate, although containing merely the same amount of alcohol. The produce of the prolific Concord vine, said to be very popular in the United States, and by some preferred to the Catawba, was a bright, light, red wine with the obnoxious foxy flavour, however, far too prominent for European tastes. The same defect was noticeable in a less degree in the wines vintaged from the Ive's Seedling and Hartford Prolific vines, as well as in that produced from the Isabella grape, which has a marked raspberry flavour, and was at one time an extensively cultivated variety, but is now scarcely employed for purposes of vinification owing to its liability to mildew.

The finest American red wines were those yielded by the vines known as Norton's Virginia, and the Cynthiana. The former produces a well-blended, full-bodied, deep-coloured, aromatic, and somewhat astringent wine, only needing *finesse* to equal a first-rate Burgundy; the second, probably the finer of the two, being a darker, less astringent, and more delicate growth. The Clinton variety furnishes a wine of about the same body as Bordeaux, but darker in colour and tainted with the obnoxious musky flavour. Among American red wines of note in their day one may mention the produce of the so-called Schuylkill Muscadel vine, which was the only esteemed growth in the country previous to the cultivation of the Catawba grape, being in fact ambitiously compared to the *crûs* of the Gironde. It was a bitter acidulous wine little suited to the American palate, and invariably requiring an addition of either sugar or alcohol to make it keep. The same is the case with the wine furnished by the Mustang grape of New Mexico, Texas, and Arkansas;

"the fiery flood
Of whose purple blood
Has a dash of Spanish bravado."

So sings Longfellow, apparently unaware that in its natural state this wine is in reality a poor acid fluid, and that its "fiery" flood is exclusively due to the addition of 3 lbs. of sugar to each gallon of *must*, combined with 10 per cent. of proof spirit administered after fermentation, the result being a strong bodied and sufficiently agreeable tasting wine.

Of white growths the sometimes slightly rose colour wine yielded by the Delaware grape proved the most delicate, resembling a Rhine wine in character, and possessing a fragrant bouquet. The Carolinian Scuppernong, which was not represented at Vienna, being of too feeble a constitution to travel any great distance, while the grape itself can hardly be cultivated north of 35° of latitude, is a wine of the same class, but with a sweeter flavour. Next come the Herbemont, a rosy-coloured white wine, in taste reminding one somewhat of Spanish Manzanilla, and with a more agreeable freshness than Delaware, the Taylor, a Riesling-like growth, and the Cunningham, which has the character of Madeira. The Devereux vine, it may be added, also yields an excellent white wine.

Sparkling wines formed a considerable item in the American samples, the best known being sparkling Catawba, made by the same complicated process and with equal care as the *vins mousseux* of France. Some varieties are sweeter than others; some are a trifle acidulous, while all are very frothy, and have moreover too much of that musky perfume which Longfellow says "fills all the room with a benison on the giver." Apart from its scent the European wine to which sparkling Catawba may be best compared is perhaps effervescent Vouvray, while unquestionably the American sparkling wine most appreciated by the jury was the Californian Sonoma, which proved to be *droit de goût*, fresh to the palate, and not unlike a middle class Aï champagne.

From the earliest period of the colonisation of America the vine appears to have attracted the attention of the settlers, and it is said that as early as 1564 wine was made from the native grape in Florida. The first attempts to establish a regular vineyard date, however, from 1620, and would seem to have been made in Virginia with European vines, the prospects having become sufficiently encouraging in 1630 for the growers to send for French vine dressers to tend their plants. The latter were subsequently accused of ruining the vines by their bad treatment, but most likely this was an error, it having since been made evident that European vines cannot be cultivated east of the Rocky Mountains where the *Phylloxera vastatrix* prevails. It was in vain that William Penn made repeated attempts to acclimatise European vines in Pennsylvania, in vain that the Swiss emigrants made similar trials in Jessamine County, Kentucky; that Pierre Legaud laboured in the environs of Philadelphia, and Lakanal, the member of the French Convention, experimented in Tennessee, Ohio, and Alabama, all their efforts to introduce the old-world vines proved fruitless. The attempts made by the Swiss settlers at Vevay in Indiana with the indigenous plants were more successful, and after a time they produced some palatable wine from the Schuylkill Muscadel. Viticulture and vinification languished, however, in a precarious condition until attention was called in 1826 to the Catawba vine by Major Adlum, of Georgetown, near Washington, who thought that by so doing he was conferring a greater benefit on his country than if he had liquidated its national debt. This vine, which is derived from the wild *Vitis labrusca*, was first planted on an extensive scale near Cincinnati by Nicholas Longworth, who is justly looked upon as one of the founders of American viticulture, and gradually supplanted all others, remaining for many years the principal plant cultivated along the banks of the Ohio, the so-called "Rhine of America," until ceaselessly attacked by rot, mildew, and leaf blight, it was found necessary to supplant it by more robust varieties

The wines known as Norton's Virginia, Concord, and Clinton form to-day the basis of the Missouri vineyards, which promise to become not merely the most prolific vineyards of the States but also those yielding the best wines. Hermann is the centre of viticulture in Missouri, but grapes are also grown and much wine made around Boonville in Cooper County, and Augusta in St. Charles County, also at Hannibal on the Missisippi and in the vicinity of St. Joseph on the Missouri, there being hardly a county in this favoured State, which enjoys the advantages of longer seasons, a warmer climate, and more suitable soil than other regions, but has some flourishing vineyard. Inspired by the rapid success realised by Missouri both in viticulture and vinification Indiana and Illinois since 1848 have greatly extended the area of their plantations, Kentucky, Tennessee, Arkansas, Iowa, and the south-east of Michigan following somewhat less swiftly in the same direction. In the north-eastern States where grape culture is very disseminated, the greater part of the produce being employed for table use, the Concord variety grown on trellis work over the houses or on arbours prevails; the Catawba, although still represented in the Missouri and Cincinnati vineyards, being now principally grown on the isles of Lake Erie and round Hammondsport in the State of New York, where it is purchased by the Cincinnati and St. Louis manufacturers of sparkling wines and removed to their establishments. In the south-eastern region, North and South Carolina, and Georgia, the Scuppernong, which is remarkably vigorous and prolific, is the prevailing vine. In Alabama and Louisiana, lands of the sugar cane, the culture of the vine is of small importance. Texas, however, can boast numerous indigenous varieties, the chief of which is the Mustang, while California is rich in European vines, it being calculated that in 1861 the vineyards of the latter State contained 10,592,688 plants; 2,570,000 in the county of Los Angelos, and 1,701,660 in that of Sonoma, and which have since probably more than doubled in number. The system of culture varies in the different States. In some parts the vines are trained on trellises, while in others they are fastened to stakes 6 or 7 feet in height, being planted at distances varying from 3½ feet by 4, to as much as 12 feet by 12, on account of their greatly developed foliage and the large space between their shoots.

According to a report prepared by Mr. Erskine in 1858 for the British Government, the vineyard area in Ohio at that epoch was 3,000 acres; in Kentucky, 500; Indiana, 1,000; Missouri, 500; Illinois, 500; Georgia, 100; South Carolina, 300; North Carolina, 200; the total produce being estimated at 2,000,000 gallons of wine. To-day the vine is cultivated for wine making purposes over 2,000,000 acres of ground, and the produce which in 1840 was only 124,734 gallons has risen to 14,000,000 of gallons. The small proportion of wine to the vineyard acreage is only to be accounted for on the hypothesis that the majority of the plants are young. As these get into bearing the production ought to increase thirty-fold and even beyond. At the present time California alone produces about 2,300,000 gallons, and it may be mentioned that in the single State of Ohio the vineyard area had increased in 1870 to 10,446 acres, yielding, however, merely 155,045 gallons of wine, owing no doubt to so much of it being newly planted. Vinification in the United States is still susceptible of many improvements. In some cases the vine growers make their own wine, in others the grapes are bought up by the numerous wine companies established in almost every State, and whose operations are conducted on a vast scale in accordance with prevailing transatlantic notions. Their *cuveries* are immense galleries a couple of hundred feet in length by 80 broad, divided into three storeys, the ground floor containing the presses, six or more in number. The grapes on arriving from the country brought by the different growers, are thrown into a basket running along rails, whence they are emptied into the weighing machine, weighed, paid for, and thrown into a vast *cuve*, where by means of a mechanical apparatus they are transferred into a machine which slightly presses them and removes the stalks. The juice is conducted by pipes to the fermenting cuves and the mash descends to the ground floor to be placed beneath the presses. The latter are ordinarily worked by a steam-engine of 15-horse power, but if necessary can be worked by hand. Only six hours are occupied in pressing three tons of mash, and such is the rapidity with which the operations generally are accomplished that in six minutes a ton of grapes can be received, weighed, crushed, the juice transferred to the fermenting *cuves*, and the mash made ready for pressing. The smallest cellars of these establishments can store 50,000 gallons of wine and frequently as many as 350,000 gallons; some of the tuns, which are remarkably well made, holding no less than 2,200 gallons each.

When the wine is made from the grapes of the *labrusca* group, the principal difficulty that has to be contended with is to prevent too much of the strong musky flavour of the fruit from entering the wine, and which is accomplished by removing the first juice expressed from the grapes and not allowing it to ferment on the lees. In this manner the dark red grapes yield a white wine, the flavour of which is not nearly so powerful as it would have been had this precaution not been taken. The extensive introduction of the Norton's Virginia and Delaware varieties which are without this defect, has done much, however, to obviate the inconvenience. Many of the American wines contain an extremely small quantity of natural alcohol, and it has become the practice to follow out the theories of Dr. Gall—extensively in vogue, as we have pointed out, on the Rhine—and to add to the *must*, as already explained with regard to the Mustang grape, a certain quantity of sugar calculated as being deficient in the fruit itself, and which varies from 1½ lbs. to 3 lbs. per gallon. The produce of the Concord grape is probably the wine which experiences this treatment to the greatest extent. The testing of certain Californian wines showed that the Sonoma valley white variety was the one which contained the smallest amount of alcohol, indicating as it did under 15 per cent. of proof spirit, while the red wine gave 17½. The so-called Californian hock showed as much as 24½, the Angelica 26, the Californian port 31½, and a Muscat wine upwards of 33. During the year 1873 the State of California exported 1,097,742 gallons of wine, 38,657 gallons of which were consigned to Europe.

The only information which has reached me respecting the prices of American wine is that still Catawba is sold at the rate of half a dollar per bottle, and that newly vintaged Concord is 90 cents or 3*s.* 9*d.* the gallon, which is about what American wines on the average commonly command. The sparkling wines are a dollar and upwards per bottle.

In 1870 the United States imported 9,607,662 gallons of wine, valued at 5,801,000 dollars, or 1,208,541*l.*

THE WINES OF AUSTRALIA.

The Australian wines were accidentally subjected to a severe test at Vienna, owing to the peculiar constitution of the jury which judged them, and which comprised M. Tessonnière, vice-president of the wine jury, and author of the official report on the wines exhibited at Paris in 1867; M. Allier, vice-president of the Chambre Syndicale des vins of Paris, together with two other French jurors, namely, MM. Blaise and Cuvillier; Professor Nessler of Carlsruhe, author of various treatises on viticulture and vinification, and chosen official reporter to the Vienna jury; Don José de Santos, Spanish Agricultural Councillor; Conte Bertone di Sambuy of Turin; Fayk Bey, one of the representatives of Turkey; together with myself and a couple of French experts. The wines exhibited being from well-known varieties of French, Spanish, and German grapes were tolerably certain to be competently dealt with by such a tribunal as the foregoing.

Although the colony of Victoria sent 53 samples of wine to Vienna, namely, 27 of red and 26 of white, owing to negligence on the part of the agent in immediate charge of them only 30, that is to say, 14 red and 16 white, or rather more than half, were actually tasted. The highest honour belongs to Heine and Co., of Strathfieldsaye in the Sandhurst district, the whole of whose samples, consisting respectively of Hermitage, Cabernet, and Verdeilho, were classed in the first rank.

Another exhibitor whose wines proved to be of a superior character was Mr. J. Wettler, of Echuca, for out of six of his samples that were tasted, three were classed as 1, and two others as 2; Hermitage and Cabernet, the last the famous grape from which the fine red wines of the Gironde are made, being again among those which secured the highest mark. To both the above exhibitors, whose names indicate their German origin, medals for progress were awarded. Two other samples of Hermitage contributed by Mr. J. Johnson of Sunbury, and Mr. C. Pohl of Strathfieldsaye, were likewise classed 1, and secured medals for merit.

Out of simply five samples of Hermitage tasted by the jury, four were found deserving of being placed in the first rank, which made it a matter of extreme regret that no less than 11 samples of the same wine, comprising vintages ranging from 1866 to 1871, should through mere negligence alone not have been brought to the notice of the jury at either of the two sittings which were devoted to the tasting of Australian wines. So excellent indeed were the samples of Hermitage that when a third specimen showed the same striking affinity with the famous wine of the Drôme which had been already remarked in the previous samples, the French experts seemed struck with astonishment, and insisted it was fine French wine, which had been matured by a voyage to Australia and back again to Europe, that was being offered them to taste. Assurances to the contrary were at once given to them, but when a fourth bottle exhibited precisely the same high qualities they required a distinct affirmation from the agent in charge of his conviction that the wines were of genuine Australian growth, and that no substitution was being practised, before they were willing to resume their labours.

On referring to reports of the Paris Exhibition of 1867, I find Australian Hermitage spoken of by Frenchmen, who are at the least excellent judges of their own fine wines, in very favourable terms, and I observe moreover that at the Victoria Wine Exhibition of 1870, of the 17 prizes which were given, no less than six fell to the share of the Hermitage wines, while of the 14 wines securing honourable mention, seven it seems were samples of Hermitage. Any one who knows how exceedingly rare are the good red wines produced outside the limits of France and

Portugal will see in this superiority of the Australian Hermitage a fine opening for the vine growers of the colony. The Burgundies of their production which we have tasted have much of the smoothness of the Côte d'Or growths, but neither their volume, bouquet, nor flavour; while the red wines from the Cabernet grape, although they recall the growths of the Médoc, are far too thin to carry satisfactorily the extra amount of alcohol they possess, and which arises from the excess of saccharine developed in the grape under an Australian sun.

The other Victoria wines which met with recognition at Vienna included one of the character above mentioned, a Cabernet of the year 1870 exhibited by Mr. F. Gross of Sandhurst, also a fine Riesling wine of 1866, sent by a German vine grower, Mr. F. Schmidt of Berwick, and a Muscat from Mr. J. T. Fallon of Albury, whose name misprinted Jallon appears in the list of colonial awards inserted in the London Gazette under the section of New South Wales. To the three foregoing exhibitors medals for merit were awarded, besides which honourable mention was made of a Cabernet Sauvignon wine forwarded by Mr. H. de Castella of Yering, of a Hermitage of 1870 from Mr. C. Maplestone of Ivanhoe, of a Burgundy from Mr. F. Cripps of Hepburn, and of a Riesling from Mr. E. Schroeder of Chinaman's Creek, the two latter in the Castlemaine district.

Several of the best Victorian wines were evidently not represented at Victoria, notably red Irrewang, which the Rev. J. Bleasdale an experienced connoisseur in the matter of the wines of the antipodes, pronounces the best colonial wine he ever tasted, also red Kapunda, which the same authority speaks of as resembling a young Port though with somewhat different flavour. The Yering, Sunbury, and Riddell's Creek wines are described by him as delicate and dry, and admirably suited to summer drinking, while those on the other side of the dividing mountain range, including the growths of Castlemaine, Sandhurst, Wahgunyah, Albury, and the banks of the Goulbourn, are pronounced to be strong, luscious, and full-bodied.

South Australia and Queensland contributed merely 20 samples of wine between them, and even of this limited number six, for the same reason as already given, were not submitted to the consideration of the jury. Those which were tasted however secured their fair share of rewards, including a medal for progress given to the Australian Vineyards Association for specimens of Mataro (vintage 1869), Beaumont (1867), Tintara (1868), a white wine from the Pedro Jimenez grape, Temprano another Spanish white variety, and some Highercoombe amber, a sample of Highercoombe ruby being one of those which were not forthcoming. The Mataro grown on an alluvial soil was intensely dark in colour and had all the fullness and fruitiness of an unbrandied Port, with a fine fresh flavour and none of that roughness peculiar to the perfectly fermented Douro growths in the earlier years of their existence, conveying an impression that the wine was thoroughly matured. The Beaumont from a calcareous soil was of a tawny tinge, soft, sweet, and highly spirituous, and presented the closest approximation to ordinary Port of any red wine in the Australian collection. The Tintara grown on an ironstone soil had a very distinct character of its own. The colour was remarkably tawny, such as Côte Rôtie, produced from a mixture of red and white grapes, frequently assumes, while the wine itself had a robustness about it, which was only equalled by its remarkable alcoholicity, warranted as it was to be perfectly unfortified. The aftertaste was peculiar and though not exactly disagreeable might be disapproved of by many. It was a kind of *goût de terroir* common it would seem to certain of the Australian red wines, and ascribed by the Rev. J. Bleasdale "to the faulty manner of making and want of knowledge in maturing them more than to anything derivable either from the air or the soil, or the variety of grape used."

If this really be the case, why, instead of groping about in the dark, do not the Australian vine growers follow the example of their Transylvanian brethern and secure the services of able men from the Rhine where the wines are invariably well made and receive perhaps far better after treatment than in any other part of the world? This *goût de terroir* is most frequent in wines which come from a clayey soil largely impregnated with oxide of iron, and is due, says Dussieux, to the solution and vaporisation of a portion of the mineral and metallic substances. These solutions acted upon by air, heat, and moisture eventually become mixed with the elements of the sap and thus get introduced and remain suspended in the fruit. Senhor Lape, according to Mr. Bleasdale, attributes its development in the Portuguese wines to the conversion of a portion of the tannic acid into alcohol, whereas some of the best French authorities assert that it proceeds exclusively from the grape skins, and is to be obviated by not allowing the grapes to remain too long in the fermenting vats.

Of the white wines exhibited by the Australian Vineyards Association, the Pedro Jimenez of a rich golden colour was a soft, and considering the character of the grape from which it came a remarkable dry as well as pleasant wine, with a slight nutty flavour and of moderate alcoholic strength. The Temprano was of a light golden tinge and clear as crystal, singularly soft to the palate, perfectly dry, not in the least degree spirituous, and with much of the character of a Jerez wine about it, while the amber Highercombe of 1867 vintage, and produced in an open quartz soil had an agreeable dry sub-acid and slightly spirituous flavour which moreover left behind it a pleasant tonical after-taste.

A medal for merit was given to Messrs. Apps Smith and Co. for a sample of white wine from the Auldana vineyards, and from purely Spanish varieties of grape, which had the advantage of being perfectly free from added spirit, and exhibited quite as much of the freshness of a Rhine wine as many an Australian Riesling, combining with the agreeable subacidity of the latter, a genial warmth and decidedly original and pleasant flavour. Other samples of white Auldana exhibited by Messrs. Patrick Auld and Co., and into which the juice of the Tokay grape had evidently entered, had much of the character of good dry Ruster, while a red variety from the Cabernet grape had alike the bouquet and flavour of a genuine Bordeaux with somewhat more spirit, but without that increased volume which one would have preferred to have found combined with this increased alcoholicity. A medal for merit was given to Messrs. Lorimer and Co., of Adelaide, for an admirable Riesling tasted at a second sitting of the jury, when several Germans who were present went into raptures over this produce from what they regard as the national vine, which had come to them thousands of miles across the ocean. On the same occasion another Riesling wine exhibited by Mr. W. Green, of Cawler Park, whose misfortune it was to have only one out of the five samples he had sent tasted, received honourable mention.

New South Wales, the colony that first imported the vine and tended it until it had struck deep root in Australian soil, sent none of its wines to Vienna, although its red and white Bukkalla, the latter proclaimed by Mr. Bleasdale as king of New South Wales wines, are commonly understood to be among the finest growths which Australia produces. Its Carwarra from the Camden Park vineyards is described moreover as being a pale-coloured, fine, dry, thin, white wine approximating to Sauternes, but with very slight bouquet, while the red wine from the same vineyards is characterised as of the same dry character, resembling Burgundy in colour, and exhaling a peculiar and agreeable though partial perfume.

The awards made at Vienna to the Australian wine-growers may be thus summarized. There were 16 exhibitors from Victoria, 30 of whose samples were examined, of which 11 were classed 1, and rewarded with two medals for progress and five medals for merit, while five other exhibitors secured honourable mention. In other words, 12 exhibitors out of 16 received some kind of reward.

The exhibitors from South Australia, six in number, had 14 of their samples tasted, three of which were classed 1, and obtained one medal for progress and two medals for merit, one other exhibitor having honourable mention made of his wine. In this instance, therefore, four out of six exhibitors received a reward.

The Australian wines having secured a far larger percentage of higher-class rewards than fell to the share of any other country, I asked that a Diploma of Honour might be granted to the colony for this reason, and the request was unhesitatingly complied with. Owing, however, to a rule having been laid down by the wine jury that no diploma of this character was to be given to an individual occupying an official position, or to any person or society trading for profit, I was embarrassed in my choice as to the individual or body to whom the diploma might properly be granted, but eventually fixed upon the Acclimatization Society of Victoria as being, if not the actual representative of the Australian wine-growers, at any rate the one corporation with which an identity of interest might be presumed to exist.

Although the application was made on behalf of the colony of Victoria, first, as being the principal exhibitor of wines, and, secondly, as having secured the largest proportion of rewards, I am free to admit that in asking for this diploma the intention was to recognise the exertions of the Australian colonies as a whole in respect to viticulture and vinification. The memorial stated that the application was based on the immense progress made of recent years in acclimatizing and cultivating the vine and in making wine by the Australian colonists, as was proved by the large number of wines classed 1 by the jury, and shown by the official protocol.

"I ask for this diploma," the memorial proceeded to say, as an acknowledgment of the energy and enterprise displayed by a few colonists who, unaided by Government grants, and regardless alike of the risks and outlay they incurred, sent for vines from a distance of more than 12,000 miles across the ocean, planted them in soils of the suitability of which they were by no means certain, tended them, and after persevering in their efforts during five and thirty years have arrived to-day at a result, the nature of which is shown by the protocol to which I have already drawn your attention.

"A diploma of honour awarded by the international jury of the Vienna Exhibition will not only be held in high esteem by the colonists of Australia whose eyes are continually turned towards Europe, but will have an important material effect, for the fact of its being granted will become known throughout the entire continent, and by tending to favour the consumption of wine in the country of its production, will contribute more than anything else to promote an abstention from alcohol, the abuse of which is the bane of the Australian colonies."

The occasional fortifying of Australian wines is the worst feature about them, and can no more be justified than corresponding practices with regard to the wines of Spain and Portugal and those of the south of France, and which ordinarily merely screen a clumsy system of vinification, or, if not this, allow of the wine travelling without having to wait until it is properly matured. Wines of the degree of alcoholic strength which those of Australia naturally attain to not only need no adventitious spirit, but have any finer qualities that they may derive from special influences of climate or soil, or which are likely to be developed in them by age, entirely destroyed by such a proceeding. The testing of very numerous samples in Australia showed that only in one instance, and this most probably a fortified wine, did the alcoholic strength of any of the Australian wines go beyond 27·8 per cent. of proof spirit, and that out of 186 samples tested at different times no more than 17, of which number five came from a single vineyard, exceeded 25 degrees.

As the natural strength of the Australian wines has latterly formed the subject of controversy in the London newspapers, it may be interesting to summarise the results of the published tests. For instance, the samples of Victoria wines showed an average of 21·77 degrees of proof spirit, the lowest on the list being a sample of Hermitage, which indicated merely 18·9; other samples of the same wine ranging from 21 to 23, and two reaching 24·1. The strongest red wine was from Echuca (species of grape not stated) which marked 25·2. The white wine containing the largest amount of spirit was from the Tokay grape, and indicated 23·8, the lowest, from the Chasselas grape, showing no more than 18·8. A second set of samples gave the subjoined results. The greatest quantity of alcohol was found in a brown Muscat, which had doubtless been largely fortified, its proof spirit amounting to 32·2, whilst next lower in the scale came Riesling and Verdeilho indicating respectively 26·3 and 26·2. The least spirituous white wine was called Ngarveno, and showed 18·6, a Riesling which followed marking 19·8. Of the red wines a sample from the Gamais grape, with a Burgundy and a Mataro, indicated no more than 16·2, although from 17 to 19 appeared to be their average strength. The red wine standing highest on the list, and dignified by the name of Gloria Australia, showed 24·9, the Hermitages, which came next, ranging from 24·4 down to as low as 18·5, the average being 22 degrees.

The South Australian wines averaged 22·67, the most spirituous of the samples being a Roussillon, and a red Glenpara, named after the vineyard and not any species of grape, and both of which indicated 26·3. The Hermitage ranged from 23 to 25, while the red wine with the least spirit was a second sample of Glenpara containing simply 17·8; next to it came a Highercombe ruby indicating 21·6. The white wines highest in the scale were Verdeilho of 25 degrees, Auldana of 24·8, and Riesling of 24, the lowest being white Glenpara which marked 18·8. The samples of New South Wales and Western Australian wines that were tested appear to have been very few. The first-named averaged 22·16 and the last 24, the red and white Bukkullah indicating respectively 20 and 22·7 degrees of proof spirit.

Although the first introduction of the vine into Australia is of comparatively recent date, and must have been beset with considerable difficulties in the days of long and uncertain sea voyages, authentic record of the circumstance would appear to be already dying out, as one of the largest Australian wine growers in a recent lecture delivered before the Society of Arts assigned the credit of the enterprise to Sir Wm. McArthur, and recorded the arrival from the Rhine of the first parcel of vines at New South Wales in 1840. This theory, however, is completely upset by Mr. James Busby's published journal of his voyage to Europe in 1831 solely for the purpose of obtaining cuttings from the best varieties of vines in France and Spain with a view to the formation of an experimental garden at Sydney. From this volume we learn that before his departure from Sydney he had already distributed 20,000 cuttings of Australian vines, the result it is presumed of previous importations, among 50 settlers, and had drunk wines of very fair quality produced by a Mr. Sadlier from the Orphan School vineyard near Liverpool, New South Wales. Mr. Busby secured cuttings from the vineyards of Jerez and Malaga in Spain and from those of Roussillon, the Champagne and the Côte d'Or in France, in addition to a couple of plants each of between four and five hundred varieties from the celebrated collection in the Botanical Garden of Montpelier as well as of 137 others from the Gardens of the Luxemburg.

These cuttings were duly forwarded in convict ships to New South Wales by permission of the Government, and by far the larger portion were successfully reared in Australia.

The vines imported from Germany nearly 10 years subsequently by Sir Wm. McArthur were planted at Camden Park, distant about 40 miles from Sydney, and were supplemented from time to time by other European varieties, and in due course the Camden wines celebrated throughout the Australian Colonies were the result. Vineyards were afterwards planted by various colonists on the banks of the Hunter river in the northern portion of New South Wales, from one of which the celebrated red and white wines passing under the name of Bukkulla were produced. While the northern colonists were thus active, those of the south were not entirely idle, and a Mr. John Smith having succeeded with a few cuttings which he had obtained from Sir Wm. McArthur imported numerous others direct from Europe, and what was of far more importance brought over three German vine dressers to attend to their cultivation. After completing their engagement these Germans settled at Albury on the north bank of the Murray river and planted a favourable site of which they had procured the lease with vines. This was in the year 1851, and as soon as success was assured they sent to Europe for their relatives and friends, and ere long a thriving German colony was settled on the hills and slopes bordering the river, engaged in transforming the district into what the colonists are now proud to term the Garden of the Vine in Australia, and regarding the waters of the Murray as those of their favourite Rhine. Large vineyards have since been laid out, and today the vine is cultivated in all the best situations along the banks of Murray river for a distance of 150 miles.

Victoria is reputed to have obtained its first vines from the vineyards of Sir Wm. McArthur at Camden Park, and it is said the earliest plantation was in the Geelong district. Other cuttings were obtained from South Australia, which had already imported vines direct from France, Portugal, and Spain, while the vineyards on the Barabool Hills were being planted with vines brought over direct by Swiss and German immigrants. The gold discovery in 1853 gave a serious blow to the wine industry in Victoria, owing to the high prices which grapes in common with all other kinds of fruit commanded, the scarcity of labour, and the low rate at which the imported wines that glutted the market were offered. When things righted themselves new vineyards were planted in the Sunbury and Sandhurst districts, at Riddell's creek, and along the Murray and Ovens rivers, the first of which forms the boundary between Victoria and New South Wales, and where now every farmer cultivates his vineyard and drinks his own wine. In the meanwhile the South Australian colonists with Dr. Kelly and Mr. Patrick Auld at their head, on learning of the success which had attended Sir Wm. McArthur's experiments, had ordered vines, as already mentioned, on a large scale from the principal wine producing countries of Europe, importing foreign labour to superintend their cultivation, and soon succeeded in securing a deserved reputation for their wines, which are in fact admitted to be among the best which Australia produces.

The species of vine most generally cultivated in Australia are characterised by Mr. Fallon, who has had considerable personal experience of them, in the following terms:—

"The Riesling is one of the most desirable grapes to cultivate. Although not a large bearer, the vine is hardy; the fruit, being in small conical bunches, is far less liable to danger from wet before vintage than other kinds. The wine produced from this grape is not to be surpassed in quality by any other white wine manufactured in the colonies. Verdeilho produces a generous rich wine of fine bouquet; like the Riesling, it is a shy bearer, and easily affected by cold winds during the blossoming season." The Verdeilho it may be remarked is a Portuguese variety cultivated to some extent in the Oporto district and more especially in the neighbourhood of Penafiel, and prevalent in the vineyards of Madeira.

"The Aucarot grape makes a wine equal to any of the colonial white wines; but, like the Verdeilho, it is tender and delicate while in flower, and a full crop cannot always be relied on." By the "Aucarot" grape Mr. Fallon can only mean the Morillon blanc, known otherwise as the Auxerrois blanc, of which Aucarot is evidently an Australian corruption. "The Chasselas is a hardy plant, and generally bears a large crop, and from it pure light wine of a delicate flavour is made, which is much liked as a dinner wine. The Pedro Jimenes is a large bearer; a good yield may invariably be relied on, as the vine is hardy, and produces a strong wine of good keeping qualities, but rather coarse in flavour, not unlike sherry." Other white varieties cultivated to a less extent are the Palomino, the dominant Jerez grape, the Gouais, the Pineau blanc, with the Marsanne and the Roussane, from a combination of which white Hermitage is produced, and the Furmint or Tokay grape.

"Among the red varieties the Shiraz is a hardy vine, a moderate bearer, yielding a fair crop, and makes a fine strong wine of good quality and flavour; in the colony it is highly recommended by the medical faculty for invalids and persons requiring a strengthening beverage." The Shiraz, or Sirrha as it is commonly styled in Europe, is the Hermitage grape, and the wine, which as already observed is the best red wine which Australia produces, is deserving all the commendation Mr. Fallon bestows upon it. "The Malbec and Carbinet are both hardy varieties. The plants yield a larger crop than the Shiraz, and produce wine of excellent flavour and bouquet, recommended as the best wine that can be taken by persons of a weak constitution." These are the grapes from which the finest Bordeaux is made.

"The Burgundy is a small producer, but an excellent wine is made from the grape; the bunches are small and conical, like the Riesling; a fair average crop may be relied on. The Roussillon is a prolific bearer, a hardy vine, not subject to blight, producing a wine of light quality, but of good flavour, and considered a most agreeable dinner wine. The Gamais and the Mataro are two other varieties. Another popular vine is Brown Muscat, a large bearer, and producing a rich and luxurious wine."

Some statistics respecting vine cultivation and wine production in Australia, and for which I am further indebted to Mr. Fallon, will appropriately close this notice of Australian wines. With reference to South Australia, which ranks as the largest producer, Mr. Fallon says:—

"The year 1850 showed only 282 acres under cultivation, while 1860 showed 3,180 acres, on which 1,874,751 vines were bearing, and 1,948,510 unbearing, and from which 182,087 gallons of wine were produced, and 23,398 cwts. of grapes were sold for table use. By the year 1864-5, 6,364 acres were under cultivation, on which 6,586,009 vines were bearing, and 2,831,971 unbearing, and from which 798,647 gallons of wine and 30,627 cwts. of grapes were produced. The year 1871 showed 6,131 acres under cultivation, on which 5,783,674 vines were bearing, and 385,084 unbearing, and from which 801,694 gallons of wine were produced, as well as 85,847 cwts. of grapes for table use."

"Next in order come the statistics of Victoria:—The year 1855 showed 274 acres under cultivation, producing only 11,000 gallons of wine. In the year 1865 4,078 acres were under cultivation, on which 8,199,618 vines were planted, from which 176,959 gallons of wine and 18,063 cwts. of grapes were produced. The year 1872 showed 5,523 acres under cultivation, on which were planted 9,671,292 vines, producing 713,609 gallons of wine, in addition to 30,896 cwts. of grapes.

“The New South Wales statistics show that in the year 1863, 1,459 acres were under cultivation, producing 144,888 gallons of wine, and 420 tons of table grapes. The year 1867 showed 2,281 acres under cultivation, producing 242,183 gallons of wine, and 668 tons of grapes. In 1872 there were 4,152 acres under cultivation, producing 413,321 gallons of wine, and 508 tons of grapes for table use. In addition, there were 607 acres of unproductive vines.

“On comparison of the various figures, it will be found that the colonies of South Australia and Victoria far outstrip the older colony of New South Wales, the colony of South Australia standing first and foremost as the fosterer of the vine and wine making.

“Taking the various returns for the year 1872 of the several colonies, it will be seen that South Australia has 1,372 acres in excess of New South Wales, and produced 388,373 gallons more of wine. Likewise, it has 608 acres in excess of Victoria, and produced 88,055 gallons more wine; while Victoria exceeds New South Wales by 764 acres, and 299,288 gallons of wine.”

THE WINES OF THE CAPE OF GOOD HOPE.

The Cape of Good Hope sent samples of well nigh all its wines to Vienna including its Ports and Burgundies, its pale and brown Sherries, its sweet and dry Madeiras, its Pontac, its Steen, its so-called Frontignac, and above all its celebrated Constantia. Unfortunately the majority of them were so charged with alcohol as to shock continental palates already sorely tried by the highly spirituous samples exported by Portugal and Spain. Russell and Co. of Cape Town sent 10 different kinds of wine, but only in the single instance of a dry Pontac did they secure the classification of No. 1, which obtained for them a medal for merit. Collinson and Co.'s samples were very much better, more especially the sweet varieties, although one specimen of so-called Sherry was found to possess sufficient merit to be classed in the first rank. This wine, although by no means of the Jerez type, was evidently the produce of some sweet Spanish grape, and with the exception perhaps of a small amount of added spirit was to all appearances a perfectly natural wine of exceedingly rich flavour. Three other of Collinsons' samples were classed 1, of which the best was their red Constantia, very bright in colour, a little too sweet to the taste, not particularly spirituous, and with a full amount of that refreshing sub-acidity which alone renders these luscious *vins de liqueur* tolerable. Next came the syrupy wine termed Constantia sweet Pontac, intensely deep in colour and of the consistency of molasses, and then a Constantia Frontignac, a white wine of fine flavour but too sweet and spirituous for its higher qualities to be readily discernible. For these samples Messrs. Collinson and Co. secured a medal for progress, medals for merit being given to Messrs. J. P. Cloete and Cloete Brothers for other samples of Frontignac and Constantia.

There were only four exhibitors of Cape wines, and the whole of them secured medals, invariably however for *vins de liqueur* excepting in the single instance of the Cape Sherry exposed by Messrs. Collinson and Co.

Constantia, the one wine of any mark for which the Cape is celebrated, comes from the vineyards at the eastern base of Table mountain, which take their name from the wife of the Dutch Governor Van der Stell under whom the vines were originally planted. The soil is red ochrous chalky marl and white sandy gravel mixed with chalk, both being impregnated with oxide of iron. The vine cultivated is the red Muscat similar to that of Frontignan and in all probability imported thence. It is known that at the epoch of the revocation of the Edict of Nantes numerous Protestant families emigrated from Frontignan to Sweden, America, India, and the Cape of Good Hope, and French authors say that those who settled at the Cape carried with them the vines of their country, the red and white Muscat, then as now very abundant at Frontignan. Subsequently the same settlers are said to have naturalized the Teinturier vine. The white Muscat made at Constantia goes under the name of Frontignac which seems sufficiently to indicate its origin, and Pontac if not obtained directly from the red Muscat vine is produced very likely from white Muscat grapes coloured with the Teinturier.

The wine growing interests of the Cape of Good Hope were gradually, but none the less certainly, sacrificed to a pernicious system of protection. When the wines of the colony were admitted to England at only half the rate of duty levied on those of foreign countries no real competition existed between them, and Cape wine was made, not so much to be drunk by reason of any merits of its own, as to be mixed with other varieties, when it might either be palmed off in England as Sherry, or be re-shipped abroad for the sake of the drawback which used to be claimed and moreover paid according to the rate of duty levied upon foreign wines, and which of course admitted of a considerable profit being made by the transaction.

When in 1860 the duties on wine were equalised according to their degrees of alcoholic strength, Cape wines had to make their way on their own merits, and the returns soon commenced to show a considerable falling off in the quantity imported. The fact is that so long as protection lasted the wine was carelessly made and, as is invariably the case, fortified to conceal its defects, and this too as no wine on the face of the globe had ever been fortified before, so that when it came into competition with less potent and more fresh tasting vintages its defects were apparent even to the least educated palates. The earthy flavour, long a standing reproach to Cape wines, was attributable to the grapes being allowed to grow actually on the ground, and to the dirt which they necessarily accumulated being thrown into the wine press with them.

Cape wine which before the equalisation of the duties was imported into England to the extent of 785,926 gallons annually has now fallen to about one-eighth of that amount and shows no tendency whatever to increase. As a wine producing region its fate would appear to be sealed.

Among the wines which I missed tasting were some samples from the Celestial Empire, from Chili, and from Tunis, besides Morocco wine from Tangiers and Mogador, Egyptian wine from Fayam and the Delta of the Nile, and white and Emperor wines from San Paulo in the Brazils.

The following table summarises the various awards for wines at the Vienna International Exhibition of 1873.

Countries.	Number of Exhibitors.	Diplomas of Honour.	Medals for Progress.	Medals for Merit.	Honourable Mentions.
France - - -	278	1	21	38	83
Germany - - -	256	—	21	65	71
Switzerland - -	15	—	1	5	7
Austria - - -	490	2	18	69	163
Hungary - - -	253	1	7	50	76
Russia - - -	28	1	1	7	4
Portugal - - -	92	—	5	17	26
Spain - - -	249	1	27	79	62
Italy - - -	259	—	11	24	62
Greece - - -	25	—	2	2	6
Turkey - - -	50	—	6	10	19
Roumania - -	28	—	—	2	6
United States - -	17	—	4	3	2
Australia - - -	22	1	3	7	6
Cape of Good Hope -	4	—	1	3	—
Algeria - - -	—	—	—	2	24
	2026	7	128	373	587

In concluding this Report I have to express my acknowledgments to my colleagues of the wine jury for their courtesy and assistance, notably to Herr Julius Wegeler, of the well-known house of Deinhardt and Jordan of Coblenz, for some interesting particulars respecting the wines of the Rheingau, to Conte Bertone di Sambuy for statistical and other information relative to the wines of Italy, to Senhor Fradesso da Silveira for copies of official reports on the wines of Portugal, to Professor Nessler of Carlsruhe, Herr Adolph Ott of Berne, Mr. John Paget of Klausenburg, M. Salomon of the Imperial Garden of Nikita in the Crimea, M. Teissonière of Paris, and especially to M. Louis Tampier of Bordeaux for the valuable notes he supplied me with on various wines which I missed the opportunity of tasting.

The few closing remarks that suggest themselves may be prefaced by an emphatic disapproval of the recognition accorded by the jury to certain imitation wines, as chemistry already sufficiently lends its aid to impair the general purity of wine without needing fresh impetus in any such objectionable direction. Many of the processes for transforming one wine into another are, no doubt, innocuous enough; still it is difficult to determine exactly where harmlessness ends and deleteriousness begins. Exception may further be taken to the undue encouragement which as a rule the awards of the jury appear to offer to the production of *vins de liqueur*, the merits of which, with certain notable exceptions, are rarely of a very high order. The tasting for well nigh two months of wines from nearly all the nations of the world, coupled with much special information which I was able to obtain from my associates, left upon my mind the broad impression that the sources of our wine supply are daily multiplying, that great improvements are steadily if somewhat slowly taking place both in viticulture and vinification in regions where until quite recently the most primitive practices had prevailed for centuries. Wine-growing countries are never so exigent with regard to the brilliancy of colour and the perfect purity of flavour of their produce as those nations which are simply consumers of it; consequently greater care is only bestowed upon its manufacture when it becomes an important article of commerce, and commands an enhanced price. If the taste for natural in opposition to fortified wine is only generally encouraged and maintained, a few years will see a considerable abandonment of the custom of adding alcohol to wine under the false pretence of its absolute necessity to insure the wine travelling well and continuing sound. The Portuguese Government is already alive to the disadvantage in which Portugal is placed *vis à vis* with France with respect to the vintaging of its ordinary wines, shown by the appointment of a Royal Commission, the members of which condemn the prevailing practice of adding spirit to wine designed for export, as thereby destroying its fresh and natural flavour. Fortified wines of this description it should be remembered are never by any chance consumed by the inhabitants of the country where they are produced. They avoid them as the manufacturers of imitation wines avoid their own compounds. I remember, when at Cette, one of the largest of these amalgamators, in allowing me the run of his extensive cellars, candidly enough informed me that he would not admit a single one of his transformed products to his own table.

So long as the present differential wine duty is maintained in England encouragement is no doubt given to the importation of a class of wines adapted for drinking freely of at meals over those which contribute to a species of disguised dram drinking, still I cannot see that this is a public disadvantage and indeed regard it as directly the reverse. Instead of equalising the duty as demanded it would be far preferable to reduce the existing impost on wines, containing no more than 26 degrees of proof spirit, one-half; or better still to abolish it altogether, when we should have wholesome common wine as cheap as beer, and excellent table wine such as one drinks regularly in France at 10*d.* per bottle.

With all the increased consumption of wine in the United Kingdom, a comparison of the quantity drunk during the year 1872 by 1,851,792 Parisians with the quantity consumed during the same year by 31,628,338 inhabitants of Great Britain and Ireland, shows how little a wine-drinking people we really are. The Parisians drank no less than 85,849,304 gallons of wine, equal to upwards of 40½ gallons per head, whereas the entire population of the United Kingdom drank merely 16,878,169 gallons, or less than one-fifth of the quantity consumed by the inhabitants of Paris alone, and only a little beyond half a gallon per head. No doubt we more than made up the deficiency by beer and spirits. During the 20 years that London and Paris have been within a 10 hours' journey of each other, with the two nations intimately linked together for two-thirds of that period by liberal commercial treaties, we have been slow to follow the one good example set us by our neighbours.

Paris, February 1874. HENRY VIZETELLY.

REPORT on the BEERS at the VIENNA UNIVERSAL EXHIBITION of 1873. By HENRY VIZETELLY, ESQ.

OUR so-called national beverage was largely represented at Vienna, although the English samples were comparatively few. There were, however, three daring exhibitors who had sent beer all the way from New Zealand to simmer, if not to boil, in the high temperature of the Vienna Industrial Palace. Of course all the great breweries in diverse parts of the complex Austrian empire, with the celebrated Dreher at their head, took part in the competition, as did Hungary and North and South Germany with their salvator, schink, lager, luxus, braun, and weiss beers. Some excellent samples came moreover from Denmark, Norway, and Sweden; Russia and Poland too forwarded a few specimens, as well as France, Belgium, Italy, Switzerland, and Spain. There were also exhibitors of beer from Roumania, and even from China and the Brazils.

In what was termed the Eastern Agricultural Hall the Austrian and other breweries made rather a picturesque display. One of their trophies was composed of a pyramid of beer casks, interspersed with bottles of Märzen beer, its four corner pedestals being decorated with typical topers coloured to resemble life, and representing a student, a soldier, a peasant, and a priest. Another was constructed in the form of a cave, above which the mythical beer-imbibing king Gambrinus, resplendent in red, green, and yellow, and holding a foaming beaker of ale in lieu of a sceptre in his hand, was seen seated on a throne, while within the cave itself half a dozen inebriated gnomes in the guise of medieval cellarmen, were battling over a barrel of beer with their overturned flagons littering the ground. A Strasburg brewery set off its Bacchanalian pile of barrels with the figure of a blond Alsacienne, her hair decked with the customary large black bow; and a Swedish firm decorated their stand with a painted statuette of a pretty pert-looking flaxen-haired peasant-girl in picturesque Delacarlian costume, emptying the contents of a bottle of Drontheim pale ale into an old-fashioned ornate flagon, while in front of her was posed a Norwegian peasant seated astride a cask of export beer from Christiania. When, however, the time came to taste the samples, all the beer barrels and bottles picturesquely encircled with trailing hops, which occupied the Austrian and other exhibitors' stands proved to be entirely empty. For the Austrian and many of the German beers although-most agreeably light and exceedingly refreshing, are adapted solely for rapid consumption and cannot support even a moderately warm temperature. The exhibitors therefore applied for permission to deposit their samples in an iced cellar contiguous to the Exhibition Palace, where they might be tasted by the jury. I opposed this solely on the ground of the injustice which would be done to British exhibitors, whose samples had not only travelled a long distance, but had been already exposed for two months to a temperature sorely calculated to try their export qualities. It was offered me to substitute new samples of British beers, but I pointed out the impracticability of this course, more especially with regard to the exhibits from New Zealand. On the matter being put to the vote, a majority were in favour of according the permission asked for by the Austrian and German brewers, and in consequence 56 of the former sent in samples amounting to more than 200 in number, and which, excepting their incapacity to withstand a high degree of temperature, were, for the most part, of excellent quality.

AUSTRIA.

The Austrian beers like all the light beers of Germany are brewed in accordance with the Bavarian system, and are generally a very superior class of beverage. They are of a pale amber colour, exceedingly bright and sparkling, and of a full pleasant flavour, entirely free from acidity, remarkably light drinking, are invariably in fine condition, owing to their being kept constantly iced when the weather is in the least degree warm, and always carry a rich creamy head. The marked difference between the Austrian and lighter German beers and those of England arises principally from the brewing, still the after treatment and certain exigencies of climate contribute materially to the contrast. Austrian beer is not nearly so strong as English beer, yet from the quantity of unfermented extract which it contains, it drinks fuller so to speak in proportion to its strength and is infinitely more refreshing. In Vienna everybody drinks beer, which even figures regularly at the Imperial dinner table, and owing to its exceeding lightness quadruple the quantity can be consumed as could be partaken of in England without the risk of getting intoxicated.

The great speciality in fact of the Austrian and lighter German beers is their producing neither intoxication nor drowsiness, and which is due principally to the small quantity of alcohol they contain. Still there is another important reason which appears never to have been taken in consideration, namely, the purity of the alcohol and its freedom from aldehyde and fusil oil. The Bavarian system of under fermentation, which is in general use in the breweries of Austria, prevents the formation of aldehyde and ensures the entire elimination of the gluten of the malt, which is the great oxydising agent, besides lessening the liability to produce fusil oil. The Vienna beers show upon analysis from 7 to 9 per cent. of proof spirit combined with an average of 3,000 grains of soluble extract per imperial gallen. In all fermented saccharine solutions a certain quantity of alcohol is requisite to save them from further fermentation and ultimate acidity, but the Vienna beers do not contain sufficient spirit to protect them for any length of time after they have been removed from the ice cellars. When any nitrogenous matter is present, a change takes place more readily, and although the beer is free from gluten, the most powerful decomposing agent it has to contend with, it still contains albumen, which in the act of decomposition has the property of converting alcohol into acetic acid.

In brewing the light German beers, not only much fewer hops but from 30 to 40 per cent. less malt is used than in the average of English beers, still the former are not proportionably cheaper, simply because what they lack in material has to be made up by superior production and finish. Ice, which is used in immense quantities, forms a considerable item in the expenditure of Austrian and German breweries generally. One large establishment, that of the celebrated Dreher, uses as much as 40,000 tons per annum in the brewery alone, besides the large extra quantity required in the various cellars and stores where the beer is kept, and for packing it when sent by railway in vans especially constructed for the purpose. All this is essential to maintain the soundness of the beer and ensure that brisk condition for which it is so celebrated, and although it adds considerably to the cost, the expenditure must still be incurred, or the beer after transit and exposure to even a moderately warm temperature will lose its fine character and get completely out of condition.

The consumption of beer of this perishable nature is chiefly confined to places on the continent where ice is plentiful, and where it is not the custom, as in England, for families to have beer in cask at their own homes, for a beverage of this light character can be kept on draught merely for a day or two after it has been once tapped. In no city in the world is beer to be found of such general excellence and of so uniform a quality as at Vienna, where it is almost invariably obtained in high perfection, owing partly to the more celebrated breweries being so near to the capital, but chiefly to the quick consumption at the numerous beer halls and gardens, which ensures fine condition as well as perfect freshness. The demand at many of these establishments is so great that nothing is thought of drawing as much as 1,500 gallons in the course of a single day. With this rapid draught, the peculiar and often objectionable flavour imparted by the pitch used by all the German brewers to line their casks so as to keep them air tight, is perceptible in the Vienna beer only in a very slight degree, owing, no doubt, to its scarcely having time to take it up. This flavour, however, is frequently communicated to the beer in the fermenting tuns, which are lined with pitch that partially dissolves during the fermentation process.

Vienna beer would not be considered sufficiently stimulating for general consumption in England, besides which it lacks the aroma and flavour of the hop. The Germans generally often claim for their beer the advantage of its being both food and drink, which doubtless is true enough of the beers of certain localities, where it is the practice to leave a considerable proportion of the dextrine and sugar of the wort unfermented. This class of beer, which is drunk principally by the peasantry and labouring classes, is high-coloured, clammy, and heavy in bulk. Still even the ordinary beers are regarded in a measure as so much food, and possibly the bibacious Germans do derive some benefit in this way from them. An analysis, however, of several samples shows that the total soluble extract, that is, the dextrine and sugar, comprised in an entire gallon, merely supplies the same amount of nutriment as is contained in 17 oz. of bread. Continental beer, generally, contains a larger quantity of soluble extract than English beer; although in some kinds of the latter the proportion is considerable, still their headiness is a bar to sufficient being taken to impart an appreciable amount of nutriment.

In Austria, as in all the principal beer producing countries on the continent, a great increase in the consumption of beer has manifested itself of late years, combined with a marked decrease in the number of breweries, owing to the smaller breweries being forced to succumb to the competition of the larger establishments, which are conducted on more scientific as well as sounder economic principles. Between the years 1860 and 1872, the number of breweries decreased from 3,314 to 2,636, or more than 20 per cent., whereas during the same period the quantity of beer produced increased as much as 60 per cent. In Upper Austria, where cider is largely drunk by the country people, no particular increase in the production of beer is apparent, and indeed, in years when apples have been plentiful, a positive falling off commonly declares itself. The increased consumption of beer in Austria is contemporaneous in a measure with the rapid progress of one vast brewery establishment of European fame, namely, that of Anton Dreher, at Klein Schwechat, near Vienna, which in the first year of its existence brewed merely 333,832 gallons of beer, and now brews 8,798,300 gallons, an increase of more than 26-fold. A diploma of honour was given to Herr Dreher for the improvements in brewing which he had been the means of effecting, as well as to another large firm, A. Mantner and Son, of Vienna, a medal for progress being awarded to a celebrated brewery of Vienna beer, known as the Liesing Brewery Company; and medals for merit to the Brunn and Huttledorf Breweries in Lower Austria, Hatschek Brothers, at Linz, and Herr Kuffner, at Dobling. Honourable mention was further made of three other exhibitors.

Most of the Austrian beers have a mild and soft flavour, and it is rarely that any of them are so bitter as the English pale ales. An exception, however, must be made with regard to the so-called Pilsner beer brewed at Pilsen, in Bohemia, on a very extensive scale, and much in favour with the Viennese, who do not object to pay a slightly higher price for it. This beer is exceedingly pale in colour as well as remarkably light, being even weaker than the Vienna beer, and contains a considerable amount of carbonic acid. Its distinguishing quality, however, is its strong, indeed almost medicinal bitter flavour, due to the Saaz hops, held in the highest esteem in the locality. The Citizens' brewery at Pilsen, which produces by far the largest quantity of this beer, and is in fact the most extensive brewing establishment in Bohemia, had a medal for progress awarded to it for the samples it exhibited. Another brewery company at Pilsen received a medal for merit, the same reward being given to five other Bohemian breweries, in addition to which honourable mention was made in five instances.

Bohemia has been a beer producing State ever since the fourteenth century, and its ales have long enjoyed a more than local celebrity. To-day the number of large breweries it supports are very great. Wine being neither plentiful nor cheap, and cider not being made to any extent, beer is an article of general consumption among the Bohemians, and the annual quantity produced shows an increase of no less than 76 per cent. during the last 13 years.

The samples of Moravian beer were generally of good quality, and the few exhibitors of them succeeded in securing three medals for merit, one of which was given to Count F. E. Harrach, of Janowitz—in the Austrian empire, not merely counts but princes carry on business as brewers. Honourable mention was made of a couple of other samples of which one had a count for exhibitor, and some excellent Silesian beer obtained a medal for progress for the Citizens' brewery at Troppau.

In Moravia and Austrian Silesia, the statistics indicate an increase in the consumption of beer of late years, and a corresponding decrease in the amount of spirits consumed by the labouring and rural population. Silesia besides consuming more beer itself, has increased its exports to Prussian Silesia, as well as to the neighbouring province of Galicia, which now brews a moderate quantity of beer of its own; much of it of inferior quality, although several of the samples forwarded to Vienna were of quite the opposite character, and secured medals for progress and merit as well as honourable mention. One exhibitor even ventured on sending specimens of porter, but failed in obtaining any reward.

The Styrian beer from Gratz was exceedingly good, and a medal for progress was given to its exhibitor, Herr Schreiner. Spite of the abundance of good and cheap wine which Styria produces, a considerable increase in the consumption of beer in this province has shown itself of late years, chiefly due it is thought to the great development which the iron trade has undergone during that period. Styrian beer is moreover largely exported from Gratz alike to Hungary, Carnolia, Istria, and Trieste, and thence to the East. Carinthia, which produces a considerable quantity of beer, obtained a medal for merit for its one good sample; Carnolia, which produces very little, obtained no reward, while the Tyrol had honourable mention made of some bottled beer from Roveredo.

The abundance of wine in Hungary and Transylvania exercises a considerable influence on the production of beer in the Magyar kingdom. The principal large breweries are established at Pest, where half of the total amount of beer brewed is produced. None of them, however, sent samples to Vienna; indeed the only exhibitor from Hungary was Herr Vincenz Meese, of Kasmark whose samples were found deserving of a medal for merit. There were no exhibitors of beer from either Croatia, Slavonia or the Servian Banat, where of late years there has been a moderate increase in the quantity of beer brewed.

Beer is taxed throughout the Austrian empire at the rate of 1 florin or 1*s.* 11*d.* per eimer, equal to nearly 2*d.* per gallon, when it contains 10 per cent. of hops, and half as much again when it contains 15 per cent.. In Lower Austria an additional tax is levied on beer entering enclosed towns. In 1872 the production of beer in the various provinces of the Austrian empire had risen to 268,795,775 gallons, equal to 7·6 gallons per head of the population. The quantity of beer imported into Austria during the same year is given in the official returns by weight, and amounted to 9,359 zoll-centners, whereas the quantity exported, which had increased twelve fold during the last dozen years, was 440,766 zoll-centners, or almost as many hundredweight.

GERMANY.

Bavaria takes the lead among the beer producing states of Germany, both with respect to the quantity and the quality of the beer brewed there, and several of its exhibitors naturally obtained rewards for export, salvator, salon, and bock beer, all of it being in bottle, and several samples of it having been heated in accordance with the process introduced by M. Pasteur some few years since with regard to wine. This heating of beer up to 130 or 140 degrees Fahrenheit, in order to make it keep, and more particularly to enable it to travel, appears to be a very common practice in Germany, as well as in Denmark and Norway. The Bavarian samples were generally of a brilliant colour, and of a pleasant refreshing flavour—the Bavarian hops, and especially those from Spalt, being among the very best grown on the Continent—and among the exhibitors who received rewards were Herren G. Pschorr of Munich, and H. Weltz of Spiers, with Dr. Narr of Zirndorf, near Nuremberg, the first of whom received a medal for progress, and the others medals for merit. Munich, Nuremberg, and Augsburg are the great brewing centres in Bavaria, and in 1872 nearly 290,000 quarters of malt were used in the breweries of these three cities, which produce between them about one-fifth of all the beer brewed in Bavaria. Two considerable establishments for brewing braun and weiss bier are carried on by the State, but the largest brewery is that of Herr Gabriel Sedlmayz at Munich, which consumed 52,648 quarters of malt in 1872. The system of brewing long since originated in Bavaria, has now extended over the entire continent, where with the exception of strong ales and porter, nearly the whole of the beer consumed is brewed by the Bavarian method of under fermentation, respecting which a brief explanation may here be given.

In brewing beer, during the process of fermentation, two distinct classes of chemical action takes place, the first one of simple combination between the nitrogenous matter and oxygen, for which the former has a strong affinity, and the second the re-arrangement of the elements of its saccharine. The former is brought about solely by the juxtaposition of the nitrogenous bodies and the oxygen of the atmosphere, while the latter is induced by a species of catalytic action of the other. In the fermentation of the wort, the first step is the absorption of oxygen by the soluble gluten, which becomes insoluble, and is eliminated in the form of yeast. During this action the elements of the saccharine present are transposed, and form alcohol and carbonic acid, and should the action be prolonged, the alcohol by absorbing oxygen will become converted into aldehyde and acetic acid. The same result would ensue if the fermentation should be carried on at too high a temperature, since heat materially increases the affinity of alcohol for oxygen.

Malt contains considerably more nitrogenous matter than is necessary for the transformation of sugar into alcohol and carbonic acid, and different waters and temperatures applied in extracting the wort exercise varying influences upon its solution, still under the most favourable conditions too much is extracted with the dextrine and sugar of the wort. These nitrogenous substances consist of gluten and albumen, and although the latter may be almost entirely removed by using a considerable quantity of hops, as in brewing bitter ale, the gluten can never be entirely got rid of by the English method, and its superabundant presence in the fermenting liquor under certain conditions promotes the formation of aldehyde, while the excess of gluten attracts oxygen, and ultimately produces vinegar.

In the Bavarian method of brewing by what is termed the system of under fermentation, the yeast falls to the bottom of the tun, and the carbonic acid is liberated so slowly that it mixes with the air by diffusion on arriving at the surface, thereby leaving the fermenting liquid in perfect contact with the oxygen of the atmosphere, and affording every facility for the complete oxydation and removal of the gluten. At the same time the low temperature (about 44° Fahrenheit), at which the fermentation is carried on—and which, contrary to the English practice, is invariably accomplished underground, and generally with the tuns banked round with ice—prevents the oxydation of the alcohol produced, and so far weakens the catalytic action upon the saccharine, that a much smaller amount of it is converted into alcohol and carbonic acid in proportion to the gluten oxydized. Moreover, this low temperature is a guarantee that neither the acetic nor the lactic acid ferment can thrive. In the English system the high temperature induces the gluten to absorb oxygen with so much energy that its catalytic action becomes greatly enhanced, causing the sugar to be transformed into alcohol and carbonic acid with such rapidity that the fermentation has to be checked before the gluten is sufficiently eliminated, thus creating a tendency to after fermentation, while the increased affinity of the alcohol for oxygen facilitates the formation of aldehyde and acetic acid. The carbonic acid, moreover, being generated in great abundance, adheres to the particles of oxydized gluten, and floats them to the surface, forming a thick scum, in other words, so much yeast, which prevents the admission of sufficient oxygen to combine with the soluble gluten, leaving the latter to obtain what oxygen it can at the expense of the saccharine, thereby inducing secondary decomposition, and a series of objectionable by-products, as fusil oil, &c. Such are the drawbacks of the English as compared with the Bavarian system of brewing.

The speciality of Bavarian and German beers brewed upon the same system is their bright and sparkling character, combined with a brisk flavour and a full frothy head. This fine condition is due to the method of fermentation already explained, and to keeping the beer in air-tight casks at an exceedingly low temperature, by the aid of ice, thereby retaining the carbonic acid gas in a compressed state until the beer is drawn from the cask. The gas upon being liberated into a warm atmosphere expands and produces partial effervescence, which gives to the beer its sparkling character and cream-like head. This condition, however, can only be insured when the cask is quickly emptied, for otherwise the beer becomes flat and undrinkable. Still the habit of using small casks and storing them in ice, even in the cellars of the retailers, enables the system to be generally carried out. In England beer is not so uniformly in fine condition, although it is frequently equally bright as the German beer, without, however, possessing its sparkling character and creamy head. The mere keeping it in ice would not impart to it these desirable conditions, but would rather serve to render it undrinkable. The Bavarian system of brewing and after treatment of the beer could only be adopted by English brewers by reconstructing their premises and plant, combined with the addition of vast cellars, which would always be difficult and often impracticable to secure. The ice moreover, if it could be procured in sufficient quantities, would entail enormous cost. Apart too from all this, beer of such a nature as would necessitate an entire cask being emptied within a day or two could never be an object of general consumption, especially in families where a cask serves for at least a week, and frequently for more than a month.

In Bavaria a tax is levied upon malt at the rate of 2⅓ florins per hectolitre, or about 3*s.* 11*d.* per 2¾ bushels. The quantity of beer brewed there during the year 1871 amounted to 202,643,856 gallons, which gave nearly 48⅛ gallons per head of the population. The exports of beer from Bavaria average 5,714,286 gallons annually.

Würtemberg is the German state which is entitled to rank next to Bavaria, with reference to its production of beer in proportion to population, although this is fully 25 per cent. below the Bavarian standard. The Würtemberg brewers, however, made but a poor show at Vienna and not even their Kaiser beer secured them any reward. During the 20 years preceding 1872 the amount of beer annually consumed in Würtemberg increased as much as 203 per cent., and this too in spite of the considerable quantities of wine and cider which it produces. In 1872 there were 61,650,967 gallons of beer brewed which allowed nearly 34 gallons per head of the population. The malt tax in Würtemberg is 24 kreutzers per simri, that is 8*d.* per 25¼ lbs.

Prussia which brews plenty of good beer obtained a fair number of rewards at Vienna, although the great Berlin and other principal breweries forwarded no samples. Three exhibitors from Dortmund and Prussian Saxony and Silesia secured medals for merit, the one from the last-named province for beer in barrel, while Herr Hinselmann of Schleswig-Holstein obtained a similar medal for export beer which had made the voyage to Jamaica and home again. The Rhenish brewery at Mayence was likewise awarded a medal for progress, and honourable mention was made of exhibitors from Hamburg and Brandenburg, which moreover was the sole recognition the Berliner Weissbier Brauerei obtained for its famous white beer.

Weiss bier, brewed from wheat malt, and considerable quantities of which used to be consumed in Germany, and more especially Prussia, some 20 years ago, has lately come largely into favour, half as much again being brewed now as was produced three years previously. Berlin is the city of all others where the *kühle blonde,* "cool fair maiden" as weiss bier is poetically termed by its admirers, is obtained in the greatest perfection, and where "bier stuben," offering no other beverage but this to their customers, abound. Weiss bier is invariably kept in stout stone bottles, doubtless because the large quantity of carbonic acid it contains would burst them if they were of glass. The little tables crowding these stuben are usually all occupied, most of the guests being past middle age, if three score and ten be taken as the standard of human existence, their rosy gills and capacious waistbands attesting a familiarity with, at any rate, some of the good things of life. In front of every one stands a gigantic tumbler which might be fitted with ease on the largest head, and which contains a liquid pale and clear as Rhine wine surmounted by a huge crown of froth not unlike a prize cauliflower. This is the famous "weiss," the mere mention of which suffices to send a Berliner into raptures.

A quart bottle of the beer scarcely fills more than a third of the huge glass, its voluminous head of froth not only occupying all the remaining space, but foaming over at the sides, hence the necessity for such capacious receptacles which a novice is only able to raise to his lips by the aid of both hands. Not so, however, the experienced toper, who by long practice has acquired the knack of balancing as it were the bottom of the glass on his outspread little finger while he clutches the side with the remaining fingers and thumb of the same hand, and thus conveys the huge tumbler to his lips. With the habitual weiss bier drinker a preliminary nip of kümmel (aniseed) is *de rigueur,* and after he has partaken of this, he will lap up his four quarts of kühle blonde as readily as his native sand sucks in a summer shower, exciting his thirst perhaps once or twice during the operation by some salted delicacy such as a lamprey. Wiess bier is drunk by preference when it is of a certain age, and in perfection it should be largely impregnated with carbonic acid, and have acquired a peculiar sharp, dry, and by no means disagreeable flavour. To the ordinary unstrung Berliner a moderate quantity of the "weiss" is as soda and brandy to a blasé Englishman. After an evening of excess, the following morning his steps invariably tend to the weiss bier stube there to quench his feverish thirst with a draught of kühle blonde, and stimulate his palled appetite with "knoblauch-wurst," a delicacy of the favourite sausage type fried with garlic.

Besides its weiss bier Berlin is celebrated for its Bayerisch bier, brewed according to the Bavarian method, as well as its bitter, braun, josty, and weizen biere. The bitter beer is very thin, whereas the brown beer is thick and often sweet. The josty beer, which takes its name from its brewer, has a flavour of herbs, and the weizen beer, brewed from wheat malt, dispenses altogether with hops.

As in Austria and elsewhere the larger breweries in Prussia are swallowing up the smaller ones which have not sufficient capital to make all the modern improvements by means of which they might compete on more equal terms with better regulated establishments. During a period of about 30 years as many as 8,601 or upwards of half of the breweries in Prussia had to give up business, although the consumption of beer was steadily increasing. The great Prussian breweries, such as the Tivoli at Berlin, which consumes

3,716 tons of malt yearly, yielding 3,330,844 gallons of beer, are arranged on a vast scale, fitted moreover with the best apparatus embracing the latest technical improvements combined with large and suitable cellars for storing the beer. Immediately adjacent are beer halls and gardens, capable of accommodating upwards of 2,000 persons under cover and more than three times that number in the open air, and where during the fine weather monster musical entertainments are given which attract crowds of Berliners to drink deeply of the excellent beer at the fountain head. Besides these Berlin breweries there are others on a large scale at Magdeburg, Frankfort-on-Main, Dortmund, Breslau, Cologne, &c.

With the increased consumption of beer in Prussia substitutes for malt have been largely introduced, and it was ascertained that during the year 1869 upwards of 3,800 tons of sugar and syrup, chiefly potato starch, 410 tons of rice, and 24¼ tons of starch, were used for brewing purposes. Altogether these substances were equivalent to 11,512 tons of malt, the duty upon which would have amounted to nearly 24,000*l.* In consequence, since the 1st of January 1873 sugar of all kinds and solutions of sugar when used for brewing are taxed at the rate of about 5*s.* per cwt., syrups being taxed at 4*s.*, starch or potato flour and dextrine or gum at 3*s.*, and rice at 2*s.* per cwt. This tax applies to the entire German empire, with the exception of the kingdoms of Bavaria and Würtemberg, the Grand Duchy of Baden, Alsace and Lorraine, and one or two insignificant privileged districts.

The malt tax levied in Prussia is at the rate of 20 silber groschen per zoll-centner, equal to 2*s.* per cwt. During the year 1872 there were 4,851,249 zoll-centners, equal to 238,644 tons of malt brewed, the tax upon which amounted to 471,649*l.*, being an increase during the space of three years of 55½ per cent. In 1872 the quantity of beer produced in Prussia amounted to 213,969,363 gallons, which gave, however, only 8⅞ gallons per head of the population. The export of beer from Prussia is exceedingly unimportant.

The principal breweries of Saxony are to be found at Dresden and the immediate neighbourhood, and one of the chief of these, situated at Feldschlössen, had honourable mention made of the samples of its beers. Dresden sends beer to all parts of Germany and ships a considerable quantity abroad from German ports; but Saxony at the same time imports beer largely from Austria. In 1872 it produced 34,021,054 gallons of beer, equal to 13⅛ gallons per head.

Among the various duchies and provinces of North Germany exhibiting beer at Vienna was Hesse, one exhibitor from which secured a medal for progress for some excellent samples of lager beer, the brewery academy at Worms having simply honourable mention made of its specimens. In most of these territories the same decrease in the number of breweries and increase in the quantity of beer brewed, already more than once remarked upon, is apparent. The annual consumption per head varies considerably, being as little as 3⅓ and 5 gallons in Oldenburg and Mecklenburg, and as much as 24⅔ and 42¼ gallons in Saxe-Coburg Gotha and Reus.

Neither Baden nor Alsace and Lorraine sent samples of their beers to Vienna. In the Grand Duchy, where the excise levied upon beer is at the rate of 1$\frac{1}{10}$*d.* per gallon, between 1862 and 1871 the annual production of beer increased 106 per cent., amounting in the last-named year to 9,220,802 gallons, equivalent to 12⅓ gallons per head of the population. In Alsace and Lorraine, the principal breweries of which are at Strasburg, an excise duty is levied on strong beer of nearly 2*s.*, and on small beer of 6*d.* per hectolitre of 22 gallons. The quantity of beer brewed annually amounts to 17,966,211 gallons, which allows nearly 11¼ gallons per head.

GREAT BRITAIN.

The samples of British beers at Vienna were but few in comparison with those contributed by Austria and Germany, and as already explained, they were placed at a very great disadvantage, owing to the long distances they had travelled at a trying time of the year, and their subsequent exposure for a couple of months to the high temperature of the Western Agricultural Hall. Half of them had been unable to resist this trying ordeal, including naturally enough the samples in barrel of the three New Zealand exhibitors. Messrs. Neville, Read, and Co.'s Windsor ale and stout were found deserving of honourable mention, and Messrs. W. Younger and Co. of Edinburgh had a medal for merit given them for their excellent bottled ales. The samples of the Anglo-Bavarian Brewery Company were however in all respects the best, their ales in barrel being the only beers in wood which proved really sound and in good condition. They were equally bright and sparkling as the Vienna and Bavarian beers, but not having been kept in ice, and possessing less of that gummy character imparted by the malt, they did not froth to the same extent, still they were sufficiently brisk and refreshing to the palate. These beers combined the special properties of our high class English ales with those of the lighter beers brewed upon the Bavarian system, and will supply the want which has long been felt of a brisk exhilarating beverage free from the stupifying results common to English beers, yet containing sufficient alcohol to protect it against acidity. To a certain fullness, devoid of anything like clamminess, they unite a pleasant flavour of the hop without being too bitter, as is the case with the majority of our light drinking beers. The samples comprised pale and export ales, and a lighter kind termed amber ale; and with reference to the latter, it was explained that the original specific gravity of the wort before fermentation was merely 1,050, or about the same as the Vienna lager beer, which will only keep so long as it is preserved in ice. The same beers were also exhibited in transparent beer bottles, to show their remarkable brilliancy of colour and the entire absence of sediment. The jury were naturally greatly surprised to find that the whole of these samples had remained in such perfect condition, exposed as they had been to a high temperature without the protection of ice; and they unanimously awarded a medal for progress to their exhibitors, the Anglo-Bavarian Brewery Company of Shepton Mallet.

I have ascertained by subsequent inquiry that the superior properties of these ales is the result of a modification of the Bavarian and English systems of brewing with malt and hops, in conjunction with the use of a material known commercially as "saccharum" a highly refined and perfectly converted sugar, entirely free from nitrogenous matter. After being converted from cane into grape sugar, it is in the most favourable condition for readily entering upon the vinous fermentation, and supplies a pure saccharine basis to the wort, fermenting simultaneously with its sugar in a regular and healthy way throughout, and at a lower and consequently safer temperature. It moreover imparts the requisite balance of sugar to support the after fermentation while the beer is maturing, whereby alcohol and carbonic acid are generated, and a perfect depuration and elimination of the nitrogenous constituents of the wort are effected, while the production of acetic acid is to a great extent prevented. Finally, by diminishing the amount of gluten in a given bulk of the liquid oxygen is absorbed more slowly, and the catalytic force considerably lowered, thus preventing the formation of aldehyde and fusil oils.

The "saccharum" above referred to, and which forms the subject of several patents secured and worked by Messrs. Hill and Co. of Southampton, is now extensively employed, and indeed represents nearly one-third of the whole of the sugar used for brewing in the United Kingdom. The ordinary glucose employed by brewers is made from farinaceous substances and is adopted as an inferior substitute for malt when the price of barley is unusually high. Cane sugar, raw or refined, is only suitable to be used in brewing when the beer is intended for immediate consumption, and is employed solely on account of its cheapness. Before it enters upon the vinous fermentation it must become grape sugar, and this conversion is dependent upon the yeast added and the gluten of the wort which is further required to convert the sugar of the malt into alcohol and carbonic acid gas. The former action is greatly opposed to the latter, and the result is an unhealthy fermentation ending frequently in putrefaction, besides which the cane sugar is never perfectly transformed, neither does the beer clarify, but retains the yeasty matter in solution, thereby imparting a bad flavour and causing it eventually to turn acid. To aid its brightening recourse is had to finings in large quantities which of course accelerates the decomposition and souring. Moreover the amount of yeast it is necessary to use combined with the high temperature induces a violent fermentation, and consequently facilitates the formation of aldehyde and fusil oils. Under the best conditions by the employment of ordinary sugar a most inferior beer to that made from malt alone is produced.

The popular notion that the intoxicating influence of English beer is due exclusively to its alcoholic strength is an erroneous one, for there are many beers containing only a very small quantity of alcohol that are highly stupefying. Ordinary English beer contains from 12 to 15 per cent. of proof spirit, which is not sufficiently in excess of the alcoholic strength of German beer to account for the difference in the effects produced. If diluted with water and reduced by this means to the Bavarian standard it would not lose its intoxicating properties in an equal proportion. Some of its headiness is undoubtedly due to the presence of aldehyde, which is never taken into separate account when analysing beer as it distils over and is included with the spirit. It has the same stupefying properties as the ethereal oils, and there is every reason to believe that the presence of these secondary products largely contributes to render English beer so objectionable. The instances of adulterating beer with coculus indicus, tobacco, and like stupefying and injurious ingredients are very rare, although, according to the Inland Revenue Reports, such a poisonous substance as copperas is occasionally, and comparatively harmless matters like liquorice, caramel, and grains of paradise are frequently used, besides which beer is no doubt largely tampered with in various ways by unprincipled retailers.

In Great Britain a similar decrease of small breweries and absorption of the trade by the larger establishments, accompanied by a great increase in the quantity of beer produced, and to which attention has been already several times called, has been going on for many years past. Beer is taxed in the United Kingdom first by a duty on malt of 1*l.* 1*s.* 8*d.* per quarter; also by a duty on sugar used in brewing, and which in 1872 was at the rate of 7*s.* 6*d.* per cwt., increased in 1873 to 9*s.* 6*d.*, and subsequently to 11*s.* 6*d.*; as well as by a trifling licence duty ranging from 12*s.* 6*d.* to 2*l.*, according to the number of barrels brewed, and which has to be paid by every brewer of beer for sale, with a supplementary tax of 15*s.* for every 50 barrels of beer brewed above 100 and not exceeding 1,000, 14*s.* per 50 barrels; above 1,000 and not exceeding 50,000, and 12*s.* 6*d.* per 50 barrels for any number beyond 50,000. The number of barrels brewed is estimated by the quantity of malt or sugar used, it being reckoned that two bushels of malt or 52½ lbs. of sugar are requisite to produce each barrel of beer.

Between the years 1851 and 1871 there was an increase in the quantity of beer annually produced in Great Britain and Ireland of 10,211,036 barrels equal to 67½ per cent., although the consumption of malt shows an increase of merely 42 per cent. During the last ten years however the annual consumption of sugar in breweries had risen considerably, that is from 3,872 to 13,325 tons. In 1870 the malt tax was levied on 6,646,935¼ quarters, in addition to which there were 688,862 quarters used in distillation and in private brewing and which paid no tax, besides 238,845½ quarters exported, either in the form of malt or beer, and on which drawback was allowed, giving a grand total of 7,096,951¾ quarters of malt produced. In 1873 this had risen to no less than 8,181,365 quarters. The total quantity of beer exported from Great Britain and Ireland during the year 1871, amounted to 483,120 barrels valued at 1,853,733*l.*; of this, more than 31 per cent. went to India and 16¾ per cent. to Australia. The exports for 1873 will no doubt exhibit a very considerable increase.

Of the 8,181,365 quarters of malt produced last year, 782,104 were free of duty for purposes of distillation, &c., and 240,728 were either exported on drawback, or used or beer so exported, leaving 7,158,433 quarters liable to duty, the tax upon which would have amounted to 7,754,969*l.* In addition there were 599,357 cwt. of sugar used in brewing, on which the duty would be 284,695*l.* The amount derived during the financial year 1872–73 from brewers' licences and the supplementary barrel tax was 472,746*l.*, which would bring up the total to upwards of 8½ millions sterling, and if to this were added the 364,083*l.* received for licences to dealers in and retailers of beer, the entire tax upon beer would be very little short of nine millions. There are no returns of the quantity of hops used by the brewers of the United Kingdom, but if we estimate these to average 2 lbs. per barrel, it would have taken 547,296 cwt. for the beer brewed last year for home consumption and export, nearly one-half of which would in all probability have been imported. In 1871, when upwards of 15 per cent. less beer was produced, 201,398 cwt. of hops were imported, chiefly from Germany, the United States, Belgium, and Holland, the exports during the same year amounting to 17,695 cwt. The number of barrels of beer that entered last year into home consumption is estimated at nearly 30 millions, or, to speak more exactly, at 1,076,844,924 gallons.

FRANCE.

The plentiful supply of good and cheap wine and the abundance of cider in the northern and western districts of France, has interfered materially with the consumption of beer in this country, which, although it has increased considerably of late years, is still confined principally to the middle classes in Paris and other large towns, with whom beer is, so to speak, a *boisson de luxe*. It is scarcely surprising therefore that there were very few exhibitors of French beer at Vienna, and that the samples of merely one of them secured recognition—the Société des Caves du Roi at Sèvres, which obtained a medal for merit. Beer is taxed in France according to its strength, the stronger kind at the rate of 3f. 50c. the hectolitre, or about 1¼*d.* per gallon, and small beer at merely one third of this rate. In 1873 there were 103,347,408 gallons of strong, and 59,814,642 gallons of small beer brewed, the tax upon the former producing 676,158*l.*, and upon the latter 130,447*l.*, or 806,605*l.* in all. All beer consumed in the towns, whether of home or foreign production, is equally liable to an octroi duty, which in Paris amounts to as much as 5½*d.* per gallon. Now that France has lost Alsace, its principal breweries are to be found in the immediate neighbourhood of Paris, at Lyons, and Marseilles. The average price of strong and small beer brewed in the north of France is 8*d.* and 3½*d.* per gallon respectively, in the east 1*s.* and 8*d.*, in the west 11*d.* and 5*d.*, and in the south, 1*s.* 1*d.* and 9½*d.*

Of the 163,162,150 gallons of beer brewed in 1873, France exported 527,813 gallons; on the other hand, it imported 6,095,225 gallons, chiefly of German beer, the imports from Great Britain amounting to only about 300,000 gallons. This leaves a total of 168,729,562 gallons for the annual consumption, which averages nearly 4¾ gallons per head.

BELGIUM.

Even Belgium, which is essentially a beer drinking country, and famous for its Faro and Lambick beers—the wort of which, after being subjected to continuous boiling, ferments for weeks and even for months—sent very few samples of its beers to Vienna, and the only exhibitor that secured any reward was a brewery company at Dietrich, some so-called summer beer forwarded from Ghent not being considered deserving of recognition. Beer is taxed in Belgium at the rate of 4 francs the hectolitre, equivalent to 1¾*d.* per gallon. The annual production, which is about the same as that of France given above, allows, however, almost 32 gallons for each head of the population. Belgium exports comparatively little beer, but its imports average 860,000 gallons annually

HOLLAND,

which prides itself principally upon its schnapps, sent no samples of beer to Vienna, nevertheless, as in most other European countries, the production of beer is on the increase here, besides which its consumption is added to by the importation of considerable quantities, amounting in 1870 to 645,500 gallons. The Dutch brewers enjoy the option of being taxed either according to the quantity of malt they consume, at the rate of about 2*s.* 7*d.* the 100 lbs., or else according to the amount of vat space which they have at their disposition. The annual production of beer in Holland is 29,838,903 gallons, which gives 8⅐ gallon per head of population. In the Grand Duchy of Luxembourg, the consumption is almost 6 gallons per head. The increase of consumption in Holland has been sufficiently marked of late years to induce the Amsterdam Chamber of Commerce to congratulate the country upon it, and to express a hope that beer will, ere long, become the national beverage and supplant schnapps, which are now drunk by almost all classes to an alarming extent.

RUSSIA.

For some creditable samples of Bavarian and Märzen beers in bottle, MM. Durdin of St. Petersburg, and Ljutoslawski of Drosdovo, in the government of Lomsha, secured medals for merit at Vienna, neither of the exhibitors of ale from Riga or porter from Kiew obtaining any recognition. With a view to the suppression of spirit drinking among the population generally, the Russian government does all it can to promote the success of existing breweries and the establishment of new ones, and of late years a steady increase in the production of beer has developed itself throughout European Russia, and more especially at St. Petersburg, Moscow, Riga, Odessa, and Warsaw. In the capital alone 7,932,389 gallons of beer were brewed during the year 1871, against 19,266,336 gallons produced in the remainder of the empire. Statistics show that in the six years between 1864 and 1870 the annual production of beer had increased 4,147,674 gallons, and that during the same period the consumption of spirits had diminished by 5,117,124 gallons. Still the spirits consumed in 1870 amounted to more than twice and a quarter the quantity of beer drunk during the same period. Much of the beer brewed in Russia resembles the lighter German beers, yet the production of porter and strong ales is largely on the increase, while the quantity of beer imported from England remains much the same, amounting in 1871 to 4,253 barrels valued at 16,131*l.* The quantity of beer annually brewed averages 26,345,726 gallons, which gives, however, merely three pints per head of the population. Beer is taxed in Russia according to the vat and boiler space of the various breweries, and this is found to be equivalent to from 12 to 14 kopecks per vedro of beer brewed, or about 2*d.* per gallon.

SWEDEN AND NORWAY.

There were 10 exhibitors of beer from Sweden and Norway, seven of whom obtained some kind of recognition for their samples. Three exhibitors of the famous Christiania export beer, which is almost identical with the Vienna beer, secured medals for merit, two Stockholm breweries receiving the same reward, and two other Swedish brewers having honourable mention made of their pale ale and Bavarian beer. In Sweden as elsewhere on the continent the number of breweries have decreased, while the production of beer has been steadily increasing. To-day this amounts to 11,519,860 gallons per annum, upwards of one-fifth of which is brewed at Stockholm. In 1870 a great impetus appears to have been given to the export of beer from Sweden, which now amounts to within less than 2 per cent. of the quantity of beer imported. In Norway about 5,502,417 gallons of beer are produced annually, chiefly at the Christiania breweries, the export ale of which has a world wide reputation. The consumption of beer in Sweden is at the rate of 2¾ gallons per head, while in Norway it amounts to nearly 3⅛ gallons.

The remaining exhibitors of beer at Vienna included one from Copenhagen, namely J. C. Jacobsen and Co., who obtained a medal for progress for some excellent bottled export beer; two from Switzerland, one of whom from Berne obtained a medal for merit; five from Italy, three of whom secured medals of the same class, the best samples being the excellent maize beer of Signor Metzger, of Asti; one from Barcelona, in Spain, who had honourable mention made by way of encouragement of some very indifferent beer; and another from Roumania who met with similar recognition. There were no samples from the United States, where during the last few years the increase in the production of beer has been enormous. In 1863 only 1,558,083 barrels were brewed, but in 1871 there were no less than 7,087,826 barrels, equivalent to an increase in the annual production of 355 per cent. in the course of nearly eight years; still this amount gives a consumption of no more than 5¾ gallons per head. Beer is taxed in the United States at the rate of 1 dollar (4*s.* 2*d.*) per barrel containing 31 gallons, in addition to which there is a special tax which in 1871 produced nearly an extra 10 per cent.

The annexed table shows the quantity of beer brewed annually in the principal beer producing countries, with the amount of duty levied and its proportion to the general taxation, together with the consumption of beer per head of the population.

Countries.	Annual Production in Gallons.	Duty in Pounds Sterling.	Per-centage of Revenue.	Consumption per head of the Population in Gallons.
Austria and Hungary -	268,795,775	2,324,695	8·28	7·59
Germany :—				
Prussia - - -	213,969,363	471,649	1·27	8·69
Bavaria - - -	202,643,856	795,608	11·03	48·37
Würtemberg - -	61,650,967	241,376	13·	33·88
Saxony - - -	34,021,054	74,967	4·06	13·31
Baden - - -	9,220,802	81,954	9·74	12·32
Other States - -	44,065,777	97,807	3·26	10·79
Alsace-Lorraine - -	18,399,672	—	—	11·44
Great Britain - - -	1,076,844,924	8,512,400	11·	34·04
France - - - -	168,729,562	806,605	—	4·70
Belgium - - - -	154,067,676	553,869	7·72	31·90
Holland - - - -	29,838,908	60,833	0·82	8·14
Russia - - - -	26,845,726	—	—	0·378
Sweden - - - -	11,519,860	—	—	3·19
Norway - - - -	5,502,417	—	—	2·75
United States - - -	219,700,461	1,625,000	2·17	5·72

HENRY VIZETELLY.

Paris, February 1874.

MR. G. PHILLIPS BEVAN.

FOOD PRODUCTS.

REPORT on the FOOD PRODUCTS of the VIENNA EXHIBITION.—By G. PHILLIPS BEVAN, F.G.S., F.R.G.S.

Introduction.

Difficulties and value of a Food Report.

A REPORT on the Food Products of any Exhibition, not strictly local, presents certain difficulties, from which the exhibits in other groups are free. The principal of these is, that there is no fixed retrospective standard, by which we can gauge the value of, or the improvement in the exhibited article, or compare it with the same class of things in other exhibitions, wherever they may have been. In objects of textile, ceramic, or industrial industry of any kind, there is a definite condition which remains and is permanent, to enable us to mark accurately the points, if any, that show progress; but food products, being perishable, and consequently changeable, we have only generalities by which to be guided: and it is not often that there is any special invention or discovery of sufficient importance to stamp an era. On the other hand, this very difficulty imparts a certain value to a Food Report, which other subjects cannot possess to the same degree. The want of individuality (if I may use the term) in the exhibits, necessitates a much wider scope from which to view our subject. A mere catalogue of food products conveys but little idea to the reader of their uses and applications, so that here an opportunity is afforded to us of looking at a country through its food resources. Both the difficulty and the value were intensified at the Vienna Exhibition, partly from the enormous size of the undertaking and the bewildering number of collections that extended, I may almost say, for miles, rendering a close inspection an impossibility, and partly from the geographical situation of Vienna, where, for the first time in modern history, a universal "Welt-Ausstellung" brought together not only the civilised nations of the continent, but also the semi-civilised peoples of eastern Europe, whose education may be said to be only just beginning. Their exhibits were, for the most part, samples of primitive countries, with great natural advantages, only requiring knowledge to produce better things. Although this remark applies more to the food group than to any other, the very vastness of the display, repetitive and frequently monotonous as it was, had a special value, for it is certain that never had the agricultural resources and food products of so many unfamiliar countries been gathered together before.

Questions involved in a Food Exhibition.

There is seldom very much that is attractive to the general visitor in this section of an Exhibition, yet no group is more important to the world at large, and to England in particular, for in it are involved the questions of general European produce, on which we are becoming year by year more dependent; of acclimatization, by which we may acquaint ourselves with new foods; of national hygiène, as to how far physique and health are affected by national diet; with many more questions not less interesting, though less momentous, such as of political economy, finance, transport, and those which appeal to ourselves as individuals in the gratification of our reasonable appetites.

Lack of information.

A minor difficulty that beset me at Vienna, was the scarcity of information which pervaded the whole of the Exhibition, with the exception of Great Britain. This was particularly the case in the food groups, not a fourth part of which were labelled, and most of those that were so, in the most general and common-place manner. A bottle of preserved fruit, hermetically sealed, with only the label "fruit," gives but little satisfaction to the inquirer, and this was the rule and not the exception. Personal explanation was still more difficult to meet with; and hence a great part of the unquestionable value of such a display must necessarily be lost. I have endeavoured, however, to obviate the difficulty, as far as possible, by inquiries in other directions.

Mode of description.

On account of the scattered condition of the food products (there being no food zone at Vienna as there was at Paris), I have judged it best to describe them according to the country in which they were placed, rather than exhaust each kind of exhibit separately; and this will enable me to deal more comprehensively with the food producing capabilities of each country. I commence, therefore, with those of our own, although many of the English exhibits are as familiar to us as "household words," and will not require much beyond the bare mention.

The food products of the Exhibition were included in two groups, one of which, Group II., was that of agriculture; while the other, Group IV., more especially comprised substances of food as products of industrial manufacture. But as Group II. embraced, among other things, cereals and plants used for food, I have been obliged to trench somewhat upon it, explaining, however, that I have not touched upon agritural questions, except when identical with those of food. In Group IV., called in German "Nahrungs" and "Genussmittel," were foods proper, as products of an industry—in fact, prepared foods; and with them I shall deal more largely, with the exception of wines and liquors, which are treated of in another place.

Nahrungs mittel.

"Nahrungs-mittel" seems to denote that class of food defined by Dr. Edward Smith, "which when introduced into "the body, supplies the material that renews some structure "or maintains some vital process; and it is distinguished "from a medicine, in that the latter modifies some vital "action, but does not supply the materials, which sustain "such action . . . . Foods known as 'Genuss-"mittel' seem to form a connecting link in that they "increase vital action in a degree far beyond the amount of "nutritive material which they supply; they thus resemble "certain medicines in their action, but as they supply a pro-"portion of nutritive material, they should be ranked as "foods." To use a familiar illustration, the Germans would call Huntley and Palmer's biscuits "nahrungs-mittel," and Crosse and Blackwell's pickles "genuss-mittel."

Genuss-mittel.

ENGLAND.

Great Britain makes no show in cereals, &c., except the well-known models of roots and vegetables, exhibited by the firms of Sutton and Co., Reading, and Carter, Dunnett, and Beale, London. A collection of specimens from Mr. Hope's sewage farm at Romford excited interest, as the result of a well tried and practical scheme. It was, however, in the class of manufactured edibles that this kingdom made such an excellent show, which both for intrinsic merit and attractiveness, created a great impression in Austria. As a matter of business, an attractive appearance and a tasty mode of putting up the article is of considerable importance, and is thoroughly understood both in this country and France. In the "delicatessen" shops of German towns, it is easy at a glance to recognize the English brands by their superior get up.

Attractive appearance.

English biscuits were represented by two of our best known makers, Messrs. Huntley and Palmer, of Reading, and Messrs. Peak, Frean, and Co., of Dockhead. The former firm was especially conspicuous for its display, and the attention given to it by visitors, together with the uniform success at the various International Exhibitions, was commented upon in the Austrian papers. Since 1851 Huntley and Palmer have appeared in successive Exhibitions in stronger and stronger force, and they may now claim to be not only the largest but the best known fancy biscuit-makers in the whole world. Not only were all known biscuits exhibited, but a great many that are unknown, as may well be the case, when over 100 varieties issue from their enormous factory at Reading. The chief novelties

Biscuits.

were the wafer or "waffel" biscuit of all flavours: ginger, seed, lemon, rose, vanilla, &c.; also a meat wafer, by which a good deal of nutriment may be taken in a portable and pleasant form. The specialities of the Reading biscuits, apart from the flavour, are the retention of crispness in all climates and the lowness of price, and they well deserved the Medal of Progress which was awarded to them. One great reason why this display attracted so much attention was, that in Germany and Austria there really are no biscuits properly so called, the term "biscuit" generally meaning some soft spongy cake; and what there are, are exceedingly insipid. Indeed, throughout the Continent and even in France, the genius of cookery seems to have failed in catching the idea of the English biscuit.

Corn flour. Of other exhibits connected with baking, were Messrs. J. J. Colman's corn-flour made from rice, an excellent material for puddings, though as a flour, rice contains less nitrogen than wheaten flour and is consequently less nutritious.

Baking powder. Borwick's baking powder is one of the most used and probably one of the best of this class of substitutes, which, apart from the question whether it is advisable to use such substitutes, is cheap and expeditious in its results. Baking powders are usually made of tartaric acid and carbonate of soda in equal proportions, mixed with some cheap flour, such as rice, to give greater bulk.

Pickles. The copiousness of Messrs. Crosse and Blackwell's selection appears to have struck the Germans very much, and certainly all that commends itself to the appetite at reasonable prices was to be found in their various exhibits of pickles, preserves, and sauces. Familiar as these are to English eyes, there are certain points to which it is worth directing attention, such as the admirable manner in which vessels and jars are adapted to their contents, so that the amount of preserving liquor always keeps its proper proportion to the preserved produce. One great reason of the success of Messrs. Crosse and Blackwell is the having at command a vast supply of pure vinegar, by which alone the requisite perfection of preservation can be obtained. The substance preserved is completely freed from water before it is put in, so that the vinegar or the brandy may not be diluted. It is impossible to enumerate all the good things here shown, and the reputation of this firm may be considered to be thoroughly secured in Europe though their Vienna exhibits.

Preserved meats. In the same category were Messrs. John Moir and Sons, of Aberdeen, with an extensive show of sauces, preserved meats, fish, chutnees, fruit syrup, and marmalades, which latter appear to be a speciality of this firm. Some of the meats preserved in 1834 are said to retain their nutritive properties perfectly. The pickles of this exhibitor were conspicuous for the brilliancy of their colours. His minute and elaborate price list in German will doubtless assist in bringing to Aberdeen a lucrative continental trade.

Sauces.

For specialities in the same class of food may be mentioned Messrs. Batty and Co., with their well-known "Nabob" sauce and curry powders; G. B. Clarke, Woburn, the "Woburn" sauce; and Messrs. Goodall, Backhouse, and Co., of Leeds, the "Yorkshire Relish." The latter firm also exhibited an excellent "pick-me-up" in the shape of Orange Quinine, while Messrs. Batty's stand was conspicuous for its bright pickles and enormous cucumbers.

Flavoring essences.

John Mackay, of Edinburgh, had a collection of extracts and quintessences for flavouring; amongst them, the claret cup essence for immediately imparting the taste of borage, curaçoa, and lemon-peel. Of greater economic use were his exhibits of Egyptian lentils, a cheap, valuable, and neglected food, the staple of the Revalenta Arabica. They were shown with and without the husks, and as meal, and it is satisfactory to find that this exhibitor earned the gold medal from the Highland Society for introducing the cultivation of lentils into Scotland. I should also mention his preparation of artificial yeast, for baking bread without fermentation, and the extract of calf's foot jelly, which was sold in packets at the low price of 6*d.*

Lentils.

Coffee extracts.

Andrew Yuille, of Glasgow, showed a variety of flavouring essences, such as celery, vanilla, &c., together with pure extracts of coffee by itself, coffee combined with chicory, and also with milk and sugar.

Condensed milk.

A similar convenience was exhibited by the English Condensed Milk Company, whose works are at Aylesbury, whence issues not only condensed milk, but also coffee and cocoa ready mixed with it. For travellers, bachelors, or when speed is desired, it is needless to point out the great advantage of these preparations, which only require a cup of hot water to make a very pleasant beverage. Condensed milk usually contains about one-third of its weight of sugar, and is exceedingly palatable to those who do not dislike sugar. Children take to it very readily, but although they apparently fatten on it, it is a serious question amongst medical men whether this fattening is altogether of a healthy character. From careful observations, it would appear that the milk has a tendency to reduce the vitality of a child below par, the reason being, that in cow's milk the proportion of nitrogen, or flesh-giving to carbon, or fat-giving material, is 1 to 12, whereas in the condensed milk it is not much more than half this amount. Sugar added to cow's milk lessens its nutritious value, and hence it is a grave question whether condensed milk should be used for the young, except when other milk is scarce and difficult to procure, or when there is any suspicion of impurity. In its proper place, however, there is no doubt that condensed milk is a most useful and valuable preparation, and it is largely used in America, where there are several milk factories.

Marmalades and Scotch preserves were shown by several exhibitors, in addition to those named, such as Jas. Keiller and Sons, Dundee, the kings of the Scotch marmalade trade, and Jas. M'Gregor and Son, of Dumfries. It is singular that marmalade is unknown to the Germans, except as an English importation, and still more curious, that with all the wealth of fruit in the country, jam is seldom or never to be seen. Most of the fruit is either preserved whole in sugar, or is stewed down into "compôtes."

Preserved meat.

Several forms of concentrated soup and meat were exhibited. Messrs. M'Call and Co., of Houndsditch, sent an excellent display of their Australian beef and mutton, to which I shall refer more at length in the Colonial Food collection (p. 8).

Portable soup.

Messrs. Hewitson and Co., London, had a useful preparation of pea soup, which is made up into tablets, and can be immediately turned into the liquid form. Beef fat prepared without salt was a speciality of this firm. Messrs. F. King and Son, London, had dishes for the British sailor, ready to be prepared at a moment's notice, in the shape of potatoes and a desiccated soup of beef and vegetables reduced to one-thirteenth of the original bulk. Geyelin and Co., of London, also exhibited cheap and portable soup packets, one of which, easily carried in the waistcoat pocket, will give a wholesome bowl of soup for two or three people.

Mustard.

In mustard, Messrs. J. and J. Colman were *faciles principes*, and often succeeded in displacing, even on Austrian tables, the peculiarly flavoured mustard for which Krems is so famous.

In cocoas and chocolates, England was exceedingly deficient, the only exhibit being that of Messrs. J. S. Fry and Sons, of Bristol, whose name is a guarantee for the goodness of this branch of comestible.

Characteristics of British exhibits.

The British collection of food exhibits, although not numerous, has worthily kept up their reputation for excellence and cheapness. If one speciality, more than another, marked the Vienna display, I should say that it was that of concentration, which is a great feature of the present age. The desire to save labour, time, and expense in other manufactures, is shown likewise in food, where the object is to save time in cooking and eating, expense in transport and packing, and labour in the facility of digestion; and the motto of the day with English provision purveyors may be said to be, not "He that runs may read," but "He that runs may eat."

British Colonies.

The food exhibits of the British Colonies, if they did not present the attractiveness of the English department, were for the most part of more importance, as containing illustrations of a commerce in food which has already reached to giant proportions, the limit of which it is difficult to foresee. I allude to the preserved Australian meat, which formed a staple portion of the Australian exhibits, and attracted very great interest amongst the Germans and Austrians, who are suffering, like ourselves, from the high prices of provisions. The meat in Vienna is for the most part costly and bad, the price for good cuts being at least 2*s.* per lb., and I shall not be surprised if eventually a very large trade springs up in preserved meat between Germany and Australia, viâ Trieste.

Australian meat.

The Australasian colonies were represented by Victoria, Queensland, South Australia, and New Zealand. A fine collection of various meats, mainly from New South Wales, was also exhibited by Mr. D. Tallerman, whose name deserves to stand prominently forward for his perseverance in introducing this class of meat into England, despite the prejudice and other difficulties which he encountered.

Victoria.

Victoria is a great grain-producing country, possessing, according to the latest statistics (1872)—

Cereals.

	Acres.				Yield per acre.
Wheat -	334,609	producing	4,500,795	bushels	13·45
Oats -	175,944	„	3,299,899	„	18·26
Barley -	16,772	„	335,506	„	20·00
Other cereals	11,204	„	212,546	„	
Potatoes -	39,064	„	125,841	tons	3·22

The average weight of the wheat is 59 lbs. to the bushel, the kinds most cultivated being White Tuscan, Purple Straw, and White Velvet. The exhibitors in this class were Wm. Matthews of Coghill's Creek, E. Buckley, the Goulburn Shire Council, and S. Burston. As regards flour-producing, there are in this colony 462 pairs of stones, which ground during the year 103,809 tons of flour and 3,625 tons of meal. Excellent wheat flour was exhibited by S. Ramsden, maize meal by T. Bennett, and maizena by M. Stewart, of Richmond—this last being a preparation of maize flour, and a cheap substitute for arrowroot. Charcoal biscuits were shown by Smith of Melbourne, a very useful and not unpleasant corrective of indigestion.

Preserved meat.

The Victorian court was particularly conspicuous for the number and variety of its preserved meats, which for the most part were put up in very attractive tins of brilliant colours and labels. That attention to the outside of a tin of preserved meat is well worth the trouble is proved by the fact, that when the meats were sold towards the close of the Exhibition, the nice-looking tins were the first to go off, while those of slovenly exterior were left to the last. The meat-preserving trade has become a large one in Victoria, and there are now 22 establishments, employing nearly 1,000 people and representing at least 100,000*l.* in the value of the plant. In 1871 they shipped not less than 14,870,000 lbs. of meat valued at 355,000*l.* The statistics of the live stock of the colony in 1872 were

799,509 cattle.
10,002,381 sheep.
177,447 pigs.

Various processes of meat preserving.

The art of meat preserving may be briefly divided into the methods by drying, antiseptic immersion, coating, pressure, heat, and cold. The first named is almost exclusively applied to German and South American meats and is seldom or ever used in England. Immersion, which may be done either in liquids or gas, has been extensively tried in this country by Messrs. Medlock and Bailey with bisulphate of lime. Professor Redwood was the chief advocate for the coating process, either by gelatine or some other material by which the meat was kept from contact with the atmospheric air. Henley's pressure process is open to the objection (as remarked by Dr. E. Smith), as to whether meat with the juices pressed out, is of much real value as food. Preservation by heat has proved most general and most successful, and as a manufacturing process, bids fair to keep its position, although with the experiments that have been instituted in the opposite direction, it is impossible to say that it may not be superseded at any moment. This vacuum process, as it is called, is used by nearly all the Australian meat establishments, the object being to exclude the atmospheric air from the tin and at the same time to take care that the meat is not overcooked by the heat employed. Overcooking is the most formidable objection that has been brought against

Australian tinned meats, some of which are more cooked than others and consequently more fibrous and stringy. The superiority of one brand over another can only admit of one of two explanations, either that the meat is originally of better quality, or that more care has been taken to prevent overcooking. The cold processes of Tellier and Mr. Mort of Sydney by temporary freezing by means of ice (naturally or artificially produced) are well known to scientific men, but although experimentally successful, they were not so commercially. Neither, up to the present moment, has been the latest development of the cold method, known as Harrison's frozen meat, the *modus operandi* of which is to freeze the meat to the bone; and as there is no waste of the natural juices nor disintegration of fibre in the course of thawing, the joint is presented to the consumer just as it left the butcher's shop. The expense of freezing 500 tons before leaving Australia is stated to be 100*l.*, and of keeping the cargo in a frozen condition during the voyage to be 75*l.*, in all about 7*s.* per ton. Although the recent experiment in this direction was a failure, another attempt is to be made, and it is therefore premature to pronounce an opinion on the ultimate result of this momentous question. The exhibitors of tinned meats in the Victorian section were the Melbourne, the Australian, the Victorian, the Western, and the Mount Ararat Meat Preserving Companies. Amongst the specialities of their exhibits were beef and mutton, roast and boiled, in endless profusion, legs of mutton (shown by the Australian Company) in whole joints in boxes adapted to the shape, roast goose, roast duck, jullienne, vegetable, bouillon, and mock-turtle soups, stewed kidneys, ox and sheep tongues, together with kangaroo-tail soup, which last was almost too much for the credulity of the visitors. Nearly all parts of the kangaroo are good for eating, though the most esteemed portions are the tail and loins; these contain large proportions of gelatine, but the hind legs are coarse and generally given to the dogs. The flesh is something like lean beef, and when young, like veal, while the tail yields an undeniably delicious soup, far superior to ox tail. Of other provisions, cured hams and bacon were exhibited by Messrs. Watson and Paterson, Melbourne, cheese by William Matthews of Coghill Creek, and tomato sauce by Edward Zorn of Oakleigh. Arrowroot of excellent quality was shown by F. Hagenauer, grown at the Mission station at Lake Wellington, Gippsland; and lastly, there was a sample of beetroot sugar (N. Levy, Melbourne), not only intrinsically good, but interesting as the commencement of a very important industry in Victoria. At present it is in its

Kangaroo.

Beetroot sugar.

infancy, but a bonus has been offered by the Government to the company, or producer which can show the first 500 tons from beetroot grown in the colony. The Victorian Beetroot Sugar Company is using a patent process, whereby the entire saccharine matter is obtained from the root; and as the beet flourishes well in this province, there is every reason to believe that a large production will result.

Fruits. The fruits of the colony were exemplified by a set of beautiful models consisting of oranges (11 kinds), citrons, cherries (26 kinds), figs, strawberries, pears, plums (11 kinds), mulberries, and loquats. The variety of these fruits sufficiently attests the soil and climate of Victoria as a fruit producer, but it was reserved for this colony to inaugurate an experiment as novel as it was successful, viz., that of

Fresh fruit. sending to the Exhibition a large selection of fresh apples which were packed in boxes lined with cotton wool and placed in an ice chamber. There were about 50 different kinds, and when we consider that they were gathered at Christmas and travelled for some 14,000 miles, the success of the experiment was unquestionable, and demonstrated the feasibility of importing fresh fruit as well as fresh meat from Australia into England. Many celebrated continental horticulturists visited this collection, and would scarcely believe that the apples were real, until convinced by the rich smell.

QUEENSLAND.

The specialities of Queensland, as exhibited at Vienna, were sugar and preserved meats; although as regards natural productions, Queensland is excelled by few countries, yielding, as she does, wheat, maize, barley, oats, hay, lucerne, rye, millet, sorghum, potatoes, leeks, onions, melons, cucumbers, beet, carrots, parsnips, sweet potatoes, beans, asparagus, tobacco, arrowroot, honey, sugar, cotton, bananas, pineapples, grapes, raspberries, oranges, lemons, nectarines, peaches, figs, apples, and pears.

Cereals The wheat sent to Vienna did not arrive in good condition, but there was very excellent flour, both wheat and maize, from the Darling Downs, besides tapioca and cassava flour (*Manihot utilissima*). Queensland, as a rule, cannot be said to be a wheat-growing country, the number of acres under crop in 1871 being only 3,061, of which 2,682 were reaped for grain and yielded 51,641 bushels, or an average of 19¼ bushels to the acre. In 1872 this yield was increased to 70,000 or 80,000 bushels, but even this is only sufficient for one half of the population of the Darling Downs district, which with that of Moreton Bay, contains the principal wheat-producing land in the colony.

Arrowroot.

Arrowroot of superior quality was exhibited by the Botanic Gardens, Brisbane. This is rather an important crop in Queensland, yielding in the last year 38,560 lbs., although as late back as 1863 it was utterly unknown. It is now gradually supplanting the West Indian or Bermuda arrowroot in the Australian market. Some good maize was also shown. In 1871 there were in cultivation 20,683 acres of this crop, which flourishes excellently on the sugar lands of Mackay and Rockingham Bay.

Sugar.

The sugar produce was largely represented. In the Mackay district, which is the great sugar district of Queensland, 2,493 acres of cane were planted in 1871, and nearly double that quantity in 1872, while the total acreage planted throughout the colony is 8,077 acres. The cane that is chiefly grown is Bourbon, known in the West Indies and the Mauritius as Otaheite, and a good average crop should yield 5,000 gallons of juice to the acre. The machinery most in use is a three-roller mill, driven by a horizontal high-pressure engine, steam clarifiers, and open train by evaporating pans. Shallow wood and iron coolers are in use, from which the sugar is taken to be dried in centrifugals. The exhibitors of sugar were A. H. Brown, Antigua, Maryborough; the Government Penal Establishment, St. Helena, made from Ribbon cane, yielding two tons to the acre; John Eaton, Eaton Vale; Messrs. Johnston & Sons, Helenfield, chiefly from Chicago cane, produce, 1½ tons to the acre. This sample was remarkable for the cheapness of the "plant" with which it was manufactured, costing only 1,300*l.* beyond the labour of the owners. H. Jordan, Logan River, showed sugar from violet cane two years old; Port Royal Mills, from Bourbon cane made in an open Wetzel pan; Ramsey Bros., Maryborough, from 40 tons, the produce of 110 acres of two year old Bourbon; R. Muir, Nerang Creek, from Ribbon cane rattoons, one year old; P. H. Nind, Pimpana, from second rattoons, 18 months old; Mackenzie Bros., Gairloch, Lower Herbert River, from Bourbon cane 14 months old, average crop 2½ tons to the acre; J. E. Davidson, Alexandra Plantation, Mackay, Bourbon cane crop from 200 acres, yielding 395 tons; Raff and Co., Cabulture, from Cherabin cane rattoons. The total yield for 1872 was 3,762½ tons, the average being 1 ton 4 cwt. 1 qr. 22 lbs. to the acre of crushed cane.

Preserved meat.

A good show of preserved meat was made by Messrs. Tooth of Darling Downs, the Central Queensland, and the Laurel Bank Meat Preserving Companies, principally in the shape of beef and mutton, while *extractum carnis* was shown by Mr. Robertson of Baffle Creek, in very convenient little pots. He claimed superiority for his extract in keeping good after being opened, thus obviating the necessity of using it all at once. The export of preserved meat in 1871 was 1,441,394 lbs. valued at 35,886*l.*; 140,105 of extract valued at 42,118*l.*, and 2,144 lbs. of essence of meat, valued at 536*l.* The total value for that year of meat export was 78,540*l.* Queensland possesses 60 times as many sheep per head, and 50 times as many cattle as Great Britain.

Coffee. The only other food product shown by this colony was coffee, exhibited by the Botanic Gardens, Brisbane. In the southern part of the country it takes from six to seven years to bring coffee to maturity, but further north, as at Mackay, it bears in the second year. There were a few native curiosities such as a cocoa nut (*Cocos nucifera*), the second that has ripened in Queensland on a cultivated tree, the Bunya Bunya (*Araucaria Bedwellii*), and Queensland nuts (*Macadamia ternifolia*), remarkable for the extreme thickness of the kernel.

SOUTH AUSTRALIA.

Wheat. South Australia stands pre-ëminent amongst our colonies for her wheat-growing capabilities, on account of the splendid quality of the yield. The wheat sent to Vienna well sustained this reputation, for no finer samples were to be seen in the Exhibition, each grain being of a size and weight that made it a perfect picture. Mr. Fisher, of Adelaide, was *facile princeps* in this department, though he was closely followed by Mr. Brooks, of Woodchester. Messrs. Magary and Co. also exhibited a fine quality of flour. In 1865 South Australia had 587,775 acres of all kinds under cultivation, of which 390,836 were under wheat, producing 4,252,949 bushels, at an average yield of only 11 bushels to the acre. The smallness of this yield arises from the reprehensible system of frequent cropping with the same produce, *i.e.* sowing wheat on the same ground for years in succession. From all that I can learn, the same system is in vogue at the present time, which is much to be regretted in the face of such unexceptionable capabilities for wheat-growing. The food exports in 1872 (the latest statistics) were:—

Exports.

Sheep, 11,017.

Preserved meat, 12,528 cwt., valued at 31,119*l.* In 1870 only 4,785 cwt. were exported, value 11,087*l.*

Hams and bacon, 84 cwt.

Bread and biscuits, 451 cwt.

Butter, 1,464 cwt.

Jam, 202,257 lbs.
Fruit, 3,381*l.*
Flour, 38,319 tons.
Wheat, 157,678 tons.
Onions, 115*l.*
Eggs, 7,965*l.*
Honey, 34 cwt.

Preserved meat.

The exhibits of the preserved meat were only two—the Adelaide Meat preserving Company, which sent a good supply of beef, mutton, pork, &c., and Mr. Bagot, who exhibited *extractum carnis.* C. Davis, of Adelaide, sent bottled fruits, currants, gooseberries, &c., which were well spoken of by those who tried them.

NEW SOUTH WALES.

It is to be regretted that New South Wales was not represented on this occasion, except individually by the contribution of meats sent by Mr. Tallerman, many of which were of New South Wales produce. The cattle which furnish meat to this colony appear to have somewhat decreased within the last ten years, for whereas the decade began with 2,620,383, it ended with 2,014,888. Sheep, on the other hand, increased from 6,145,651 to 16,278,697. The decrease of the cattle was probably owing to the ravages of pleuro-pneumonia, which was very rife up to the year 1869.

NEW ZEALAND.

Wheat.

Like South Australia, New Zealand showed remarkably well in grain, which was exhibited by the following:—J. and T. Meek, Ooamaru, Otago, velvet chaff, Tuscan and purple straw; P. Cunningham and Co., Christ Church, wheats from different growers, one of whom, J. Campion, sent a sample of 67½ lbs. to the bushel; J. H. Rogers, Canterbury; J. N. Toswill; W. D. Wood, Christ Church, samples from different growers, from Tuscan, Imperial, Suffolk white, velvet chaff, pearl chaff, and Hunter's white; J. H. Bluett, Canterbury, spring wheat cut in January 1872; the New Zealand Agricultural Society. Flour was shown by J. and T. Meek, J. H. Rogers, W. D. Wood, W. H. Lane, and G. Pannell. The following is a brief table of acreage:—

—	Wheat.	Oats.	Barley.	Potatoes.
1867 -	47,786	101,565	13,136	14,372
1871 -	77,082	123,135	23,071	12,901

The best crops are grown on the rich alluvial flats of the North island and the fertile plains of the Middle island. Of late years a considerable amount of land has been placed under wheat in Canterbury and Otago. Beautiful as is the wheat that grows in Otago, millers do not like it so well as that which grows in South Australia, owing to its being softer. The superiority of the South Australian consists in its having a thinner skin, in its being drier and containing more gluten, probably due to the favourable conditions under which wheat is ripened in that colony. The yield of wheat in New Zealand is very large, 30 to 40 bushels per acre being a fair average, although 50 to 60 are sometimes obtained, and even 70 on more than one occasion; while in South Australia, as we have just seen, the average is but 11 bushels, in New South Wales a little above 15, and in Tasmania 18½. Nelson is the most productive district for barley, and Canterbury and Otago for oats, 45 bushels per acre being an average yield, though over 90 have been reaped. Maize is only grown in small patches in various parts of the North island, and principally by the natives. Potatoes yield 10 to 20 tons per acre, and grow equally well in the light, rich, volcanic soil of Auckland and the alluvial soil of Otago.

Preserved meat.

Preserved meat was exhibited by two establishments, the Canterbury Meat Preserving Company and Mr. Dornwell (Three Kings' Company), while some very excellent hams and bacon were sent by J. Gilmore.

According to the latest statistics there were in New Zealand—

436,592 cattle,
9,700,629 sheep,
151,460 pigs.

And for other produce there were made in the colony—

5,199,072 lbs. butter,
2,547,507 lbs. cheese.

Cheeses were shown at Vienna by Mr. Knight, of Nelson, and by the New Zealand Agricultural Society.

Chicory.

Chicory was exhibited by E. W. Trent, Christ Church, of quite as good quality as that grown in England. The climate and soil is very favourable to its growth, and on good ground 18 to 24 tons per acre are obtained.

MAURITIUS.

Sugar.

The Crown colonies do not offer very much scope for remarks except Mauritius, which sent a particularly fine show of sugars of the great size and beauty of crystallisation for which that island is famous. The exports of sugar in 1812 amounted to only 467 tons, but this rapidly increased to 132,371 tons in 1863, and 103,065 in 1869. The cause of the decline of the last few years has been bad harvests, and the ravages of borers and other destructive insects. The kinds of cane which are most commonly grown are the red and white belloguet, white diard, white striped and red bamboo, white renang and guingham. The great superiority, however, of the Mauritius sugar arises from the manufacture by Dr. Icery's process of purification by monosulphite of lime, without filtration by animal charcoal. "The syrups remaining from the turbinage of sugar, when treated with monosulphite of lime, give most advantageous results. Under the influence of this agent, syrups become purified, decolorised, and crystallised with remarkable facility. Manufactured by this process, syrup sugars have a perfect grain and fine colour, not entirely due to the direct influence of the substance employed, but to the preparation to which the vesou has already been submitted, and the absence in the syrup of those foreign soluble matters which are the principal obstacles to the crystallisation of the sugars of the second boiling." The exportation of sugar in the season of 1869–70 was as follows, and it will be seen that there is a large consumption in Australia, for which a rather coarse quality is made:—

United Kingdom - -	76,212,485 lbs.
France - - -	22,310,088 „
Australia - - -	99,748,587 „
Cape of Good Hope -	4,751,588 „
India - - -	59,209,368 „

The exhibitors of Mauritian sugars were Jas. Wiehe, 14 samples, and the Hon. H. Pitot. A, B, C were sugars of different sizes of crystals, filtered without animal charcoal, and the juice treated by the Icery process. These were white vesou sugars. D, E were larger crystals made from the syrup or refuse of the vesou sugars. The only other food exhibits were some preserved mangoes, by Flore Mauricienne, and pickles by H. Moizeau and Mrs. Strong.

CAPE OF GOOD HOPE.

From the Cape of Good Hope, were some excellent models of fruits, such as oranges, mandarins, nectarines, figs, almonds, and grapes, besides a selection of preserved fruits.

CEYLON.

Ceylon showed an admirable series of coffees, plantation, and parchment, &c., grown by Messrs. Volkart Bros., and Messrs. Wall and Co.

Cinnamon. Cinnamon was also exhibited, with mangoes, chutneys, and vanillas, the latter by C. P. Layard. The quantity of cinnamon exported from Ceylon is larger now than when the monopoly existed, and averages 800,000 lbs. per annum. The average price in the London market is from 2*s.* 9*d.* to 3*s.* 3*d.* per lb. The land under cinnamon cultivation is about 15,000 acres, though Ceylon cinnamon is subject to a severe competition with that of Malabar and Java.

INDIA.

A most valuable and comprehensive collection of food products was exhibited in the Indian Department, and particularly in the matter of grain. I am indebted to Dr. Forbes Watson's catalogue of the exhibits for much information, although unfortunately I did not receive it in time to enable me to study the collection by its help.

Cereals. Of wheat there were upwards of 43 different samples, principally of white wheat. But as wheat flour is too expensive for the major part of the population, it is not largely used pure, but is mixed with pulse flour, and made into cakes.

Maize. Maize or Indian corn (*Zea Mays*), of which there were 23 samples, is now widely distributed, and universally used as food for six months in the year at least. The great value of maize is that it appears to flourish just as well in a temperate as in a tropical climate, is very hardy, requires little rain, and is fit to eat (in India) in 60 days from the time of sowing. In the Deccan, the spikes are seldom allowed to ripen, but are taken off while the grain is still soft. It is fried or parched, and eaten with "ghee" and pepper or sugar; and the remainder of the crop is ground to flour.

Sorghum. Sorghum, called *Jowaree*, is rather more of a food for beast than for man, although it is used for both. Its principal value is in its prolificness, a single plant having been known to produce 12,700 seeds.

Millets. The millets were very largely represented, upwards of nine varieties being shown. The spiked millet (*Penicillaria spicata*) is used as food in the inland parts of India, and the Italian millet (*Setaria italica*) is looked upon as almost a delicacy. Cakes and a kind of porridge are made of it, and it is considered very little, if at all, inferior to wheat. It is apt, however, to produce diarrhœa. The grain of Indian millet (*P. miliaceum*) is considered nutritious, and is mostly eaten unground. The seed of the hairy millet (*P. pilosum*) is eaten boiled like rice, and seldom or never made into flour. The wild rice millet (*Oplomenus colonus*) is also used like rice, and especially eaten in the Peshawur Valley during Hindoo fasts. The Sawa millet (*O. frumentaceus*) is very digestible and nutritious, and makes a capital pudding, like, only rather nicer than, rice pudding. The Koda millet is a common grain, having the advantage of growing in barren and hilly countries, though it has greater disadvantage in its reputation for producing temporary insanity. "Raggee" is a most useful grain, and is the chief article of food in Mysore, where it is stored in pits, keeping good for many years. Job's tears (*Coix lacryma*), a grain which is used parched like maize, is remarkable for its chemical composition, and makes a capital drink for hospital patients. The bamboo grain is rather like the oat, and although not in use at ordinary seasons, is frequently eaten by jungle tribes and in times of scarcity. Many natives saved their lives by its use during the Orissa famine in 1812, subsisting wholly upon it for a considerable time.

Rice.

Rice (*Oryza sativa*) is almost bewildering in the great number of varieties, no less than 488 samples having been exhibited at Vienna. Some of the native names are very characteristic, *e.g.*, "Motachal," fat rice; "Sona-mukhi," gold-faced; "Radhuni pagol," cook-maddening; "Muni bhog," food for ascetics; "Samudra fena," sea froth; "Dudh-mani," milk-jewel, &c. Different parts of the country have their speciality of rice; for instance, the Kangra Valley possesses a celebrated kind known as "básmati;" the Peshawur Valley grows the "vara" or scented rice. Oude yields four special kinds, of which the "Mihee" and "Bansee" are superior in flavour to any others, though they are too expensive for ordinary use. The Burmese broadly divide their rices into three principal sorts, *viz.*, hard, soft, and glutinous. The "Natsieng" or hardest is that which is exported to Europe. The "Meedo," or soft, is superior in flavour when cooked, but the hard rice keeps better, and is not so much broken in the cleaning. The "Koungnyeen" or hill rice is called glutinous, because the grains adhere together when cooked. Buckwheat is principally grown in elevated situations about the Himalayas, and is sometimes eaten on fast days by the Hindoos.

Peas, &c.

The fruit of the Cajan pea (*Cajanus Indicus*) is used as a vegetable, while the pea itself is split and forms an ingredient in soups, or ground into meal and eaten with rice.

Chickpea.

The "gram" or chick pea (*Cicer arietinum*) is also held in esteem as food, either eaten raw when the grain is green, or parched and ground, mixed with wheat flour. The Chickling vetch is used in the same way, but is said to induce paralysis of the lower extremities. One of the most valuable uses of the chick pea is to furnish an acid from the glandular hairs that cover the leaves, which is said to be a certain cure for indigestion. Whether that is the case or not, the acid is so strong that it is destructive to a pair of boots to walk through a "gram" field.

Lentils.

Lentils (*Ervum lens*), are either boiled whole or ground and mixed with flour. The seeds of the Nankin bean are eaten by the natives when rice is dear, and are said to be the chief food of lascars on board ship, and of sepoys on long marches, it being carried ready boiled in their knapsacks.

Soy bean.

The Soy Bean (*Soja hispida*), is the most nourishing of any vegetable yet known, containing 36 to 38 per cent. of nitrogenous matter. It is in fact, too rich to be eaten alone, and should be mixed with substances poorer than itself to prove its real value. The seeds of the "Mutt" (*Phaseolus aconitifolius*), the Green gram (*P. Roxburghii* and *P. Mungo*) are all more or less nutritious, and are made into cakes or form ingredients in the Indian "dals" or soups. The latter is also parched, ground, and made into balls with sugar and spices for travelling purposes.

Flours.

Of the flour from the various sources, there were exhibited wheat, gram, tapioca, banana, and other meals, together with certain preparations of mixed pulses. As a curiosity, too, may be mentioned under this section "Booranee," the pollen of *Typha elephantum*, which is sometimes employed as a meal for bread.

Coffee.

The production of coffee, excellent samples of which were shown, has very much increased of late years, and planting has become a prosperous industry. During the 12 years ending in 1861, the average yearly produce had risen to 52,236 maunds (1 maund = 28 lbs.), and the revenue to 86,524 rupees, (1 rupee = 2*s.*). In Mysore the number of European planters has increased to 20 or 30, while native planters are estimated at between 3,000 to 4,000. The average yield per acre, however, is not half that of Ceylon. The coffee districts are found in the region of the Western Ghauts and the Bababooden Hills, where the plants find the requisite elevation and moisture.

Ginger.

Four samples were shown of ginger, which is the dried rhizome of *Zinziber officinalis*. Turmeric, a similar root from *Curcuma longa* is also rather largely cultivated, and when pulverised forms one of the chief ingredients of curry powder.

Pepper.

Pepper (7 samples), is the dried berry of *Piper nigrum*, a climbing plant, indigenous to the forests of Malabar and

Travancore. There is no fundamental difference between black and white pepper, but simply one of preparation, the white being deprived of the outer skin by maceration in pure water and a gentle rubbing afterwards. Several specimens of red pepper or chillies were shown, being the dried ripe fruit of a species of *Capsicum*, which when powdered, makes cayenne pepper or chillie powder. Coriander (9 samples), is also an ingredient in curry powder, although the green plant is used during the greater part of the year as a vegetable.

Dried food.

Amongst the rarer articles of food were two specimens of dried seaweed, *Euchenma spinosum* and *Gracillaria lichenoides* or Ceylon moss. Fungi were represented by dried mushrooms, and the "Jew's ear," (*Hirneola*) which is a favourite article of diet with the Chinese. Edible birds' nests, though generally considered a Chinese delicacy, are really imported into that country from the rock caves of the Burmese coast and the Andaman Islands. They consist of the inspissated mucous from the large salivary glands, with which the birds are provided. An analogous Indian food curiosity is the shark's fin and fish maw, the latter being the swimming bladder or sound extracted from the fish and dried in the sun. Fish maws are prepared on the Malabar coast, whence in 1872, 9,008 cwts. were exported to China and the Straits, valued at 301,003 rupees. From 7,0000 to 10,000 cwts. of shark's fins are also sent to China to be made into soup. The white or dorsal fins are considered the best, as they yield more gelatine; the black or pectoral, ventral, and anal fins fetch a lower price.

Sugar.

Amongst the sugar exhibits were many samples from the sugar cane, as well as from the date palm; of the former, the Aska sugar was shown by Binny and Co., of Madras, Aska being, I believe the first place where the diffusion process was applied to sugar extraction. Various other sugar products were exhibited, such as molasses, sugar candy, and "goor," a hard compound of granulated sugar and molasses. The date tree grows best in the alluvial soils of the south-eastern part of Bengal and is from 30 to 40 feet in height. The fruit, which is more a seed than a pulp, is about one quarter the size of that of the Arabian palm, which is a favourite fruit in its fresh state, while the Bengal date is not so, probably on account of the perpetual tapping of the tree for sugar. Some of the sugar products are used by the natives as physic, but whether mixed with other ingredients, or whether the medicinal effects reside in certain natural conditions of the sugar, I am unable to state. Native confectioners are fond of making preparations of sugar and seeds, and among the exhibits were confectionery of sesamum, cloves, gourd, cardamoms, cucumbers, and poppies. Probably it is with the help of this class of sweets that the "gilded pill" is swallowed.

Preserves. Indian jellies, preserves, and pickles have such a world-wide celebrity, that little but their bare mention will suffice. Among the preserves, were tamarinds, mangoes, citrons, guavas, ginger, orange, pumpkin, lime, pineapple, wood apple, and plums; while of pickles, there was an extensive variety of chutnees, and other appetisers, such as garlic, ginger, vegetable marrow, lime, carrot, potato, onion, radish, mango, yam, turnip, lemon, cucumber, and cabbage, together with mulligatawny and curry pastes.

Curry. It is worth reminding the reader, however, that curry is not an indigenous Indian dish, but was only imported into that country by the Portuguese.

Tea. Tea is the last, but not the least interesting of Indian exhibits. The cultivation of tea has proved such a great success in Assam, that it has extended to other parts of the country and is now briskly carried on at Dhera Doon, Kumaon, Gurwhal, and the Kangra valley. It has also been tried at Darjeeling, but the elevation (7,000 feet) is too great for profitable planting, it being found that a height of from 2000 to 4500 is the safest. The yield of the Kumaon and Gurwhal districts for the season of 1872 was 250,000 lbs., of the value in the London market of from 2*s.* 4*d.* to 4*s.* per lb., according to the quality. Dr. Leitner also exhibited from Lhassa brick tea, which finds such favour with the natives of Central Asia; but as this is more of a China produce, I shall refer to it again when describing that portion of the Exhibition.

Having now glanced at the food products of England and her possessions, I shall proceed to take each country according to its place at Vienna, the plan adopted being that of geographical position from west to east.

AMERICA.

America scarcely did herself justice in her food exhibits, considering her extent, and the diversified conditions of soil and climate for raising so many different crops; but the truth is, that the capacity of the United States as a food producing country, is but slightly indicated in what has been done hitherto towards developing it.

Cereals. The north-eastern States, being cold with a rather hard soil, do little but supply local demand; but in the middle states large crops of cereals are grown, and great quantities of meal and flour produced. The Genessee Valley is celebrated for its flour mills, and the Quakers of the Brandy-wine section of Delaware and Pennsylvania for their corn and maize. The average yield of cereal crops is as under:—

	Bushels.
Indian corn (maize) -	900,000,000
Oats - - -	379,000,000
Wheat - - -	220,000,000
Barley - - -	26,000,000
Rye - - -	23,000,000
Buckwheat - -	21,000,000

Maize is the most important of all these, three bushels being raised to one of wheat, which appears to be quite a secondary article of food. Illinois produces about one-seventh of the whole crop, and also a large quantity of oats. New York grows oats, barley, and buckwheat, and California, barley and wheat. Prior to 1851, indeed, this latter state grew no wheat, but she now supplies herself with breadstuffs, and ranks as one of the first of the grain exporting states of the Union. In 1871, she possessed an acreage of:—

California.

			Bushels.
Wheat	1,519,891	producing	17,888,534
Barley	696,091	„	9,845,321
Oats	113,969	„	3,724,481
Maize	57,664	„	1,445,317
Potatoes	34,931	„	3,092,177

and in the twelve months ending last October, the production of grain amounted to 20,000,000 dols.

Hog crop.

The great speciality of America is her hog crop; and although I saw no barrels of pickled pork at the Exhibition, there was in the American annexe a curious cartoon of enormous length, which portrayed the last moments of a States' pig, preparatory to being converted into pork. The magnitude of this trade may be estimated by the fact that the hog crop in 1873 was 5,700,000, being an increase of 2,000,000 on that of 1869; and this, notwithstanding the prevalence of destructive epidemics, such as hog cholera, which is estimated to carry off swine at a yearly loss of 10 to 15 million dollars. The exports from New York in 1871 were—

	lbs.
Bacon and Ham -	55,476,396
Beef - - -	40,658,520
Pork - - -	27,598,908

Canned foods.

A very large trade is also carried on in canned foods. There are now forty packing establishments engaged in hermetically sealing oysters, vegetables and fruits, turning out yearly upwards of 38,000,000 packages. There are also 60 packing houses for raw oysters, employing 3,000 persons. Mr. Underwood of Boston, sent an extensive display of tinned eatables, unfamiliar to English palates, such as devilled chicken, Lima beans, succotash, peaches and blue berries.

The Portland Packing Company exhibited tins of seguin mackerel, stone lobsters, sugar corn, and beach clams, a kind of large mussel, distinguished as hard shell and soft shell clams. A large number of persons find employment along the coast in digging them. From Onondaga came preserved fruits and jams, in which sliced pineapple appeared to be common. There were also sweet potatoes (*Batata convolvulus*), of which 42,095,026 bushels were raised in 1871.

Fruit.

California showed some fruit of enormous size, which had been galvanized over with a thin metallic coating for the purpose of preserving them. There can be no doubt but that this State will eventually become the great garden of America, and perhaps of the world.

Sugar.

Of sugar, of which there were a few samples, Louisiana and Texas are the principal producers, both of sugar-cane and maple. Of the former are raised annually about 231,000,000 lbs. and of the latter 41,000,000 lbs.

BRAZIL.

The food exhibits of South America are soon summed up. Brazil showed coffees and sugars, which rank amongst the principal exports. In 1871, these amounted to

Coffee	3,177,533 kilos. (1 kilo=2·2057 lbs.)
Cocoa	1,413,795 „
Sugar	48,932,273 „

Cassava root.

Of ordinary foods, there was Farinha de Mandioca, the flour made from cassava root. This is sometimes eaten in company with "feijao" or black bean, and sometimes stewed with "carne secca," meat dried in the sun.

Liebig's Extract.

We must not forget, however, that it is from South America that the world renowned food, Liebig's Extract, comes; probably of all foreign foods shown at Vienna, the most generally familiar by name and appearance. The seat of this establishment is at Fray Bentos on the Uruguay river, which sent out in 1871, 570,000 lbs. of extractum carnis arising from the slaughter of 122,075 cattle, valued at 330,000*l.* Another food product from the same establishment was 6,252,000 lbs. of jerked beef. The extract is prepared by boiling down the flesh of the animal, 32 lbs. yielding 1 lb. of extract. All the fat and most of the gelatine and albumen are removed, whilst the fibrine is left behind. In the strict sense of the word, Liebig's Extract is not a nutriment, but "it is not, however, to be entirely removed from the list of foods, and classed with condiments, for the salts of the flesh which it contains are valuable in the process of nutrition; but it should be classed with such nervous stimulants as tea and coffee, which supply little or no nutriment, yet modify assimilation and nutrition. Used alone for beef tea, it is a delusion."—(*Dr. Edward Smith.*) Liebig's Extract is essentially a "Genuss-mittel."

VALPARAISO.

Maté. Valparaiso showed an interesting collection of Maté, or Paraguay tea (*Ilex Paraguayensis*), which is a universal beverage in the South American states. Three qualities are used—1. The unexpanded buds, which is the best; 2. The full grown leaf, without woody fibres; 3, the whole leaf roasted, and prepared just as ordinary tea, flavoured by lemon juice and burnt sugar. It is rather more narcotic than China tea, and is somewhat deficient in theine, the active principle. It also contains a certain amount of astringent, which causes maté tea to become almost black when left to cool.

VENEZUELA.

Coffees. Venezuela had a good series of coffees and cocoas. Of the former 18 samples were shown, two of which were labelled "caracolillo," a quality which I am unable to explain. The best coffee grows in the cooler portion of the state, and the crop, which is gathered in October, begins to yield in the fourth or fifth year. The production is about 700,000 centners annually (1 centner = 113·426 lbs.)

Cocoa. Of cocoa (*Theobroma Cacao*), there are 10 different kinds, the best being obtained from a tree known as "chuao," the gathering of which is a valuable perquisite belonging to the University of Caraccas. This cocoa is largely exported to Spain, costing at Venezuela from 180 to 200 francs per 50 kilos. (1 kilo. = 2·2057 lbs.) The production is about 1,000 centners in the year. The price of Venezuela cocoa is generally dearer than that of other countries, but it is nevertheless in great request. A curiosity in this exhibit was cacao fruit preserved in glycerine.

Maize. Maize is an important crop here, on account of its early maturity. It ripens in four months, and is very productive. Two kinds were shown, the "curiollo," or white, and the "cariaco," or yellow, which ripens faster than the first. As a crop, maize is grown largely in this state, under the name of "Malojo."

Beans.

A curious collection of beans, all belonging to *Phaseolus*, was shown, under the name of "cariotas." One of these kinds, the "cariotas negros," or black bean, is in high estimation from its nutritious qualities. There were also "frijoles," or little beans, white, black, and red.

Sugar.

An excellent quality of brown Pampelon sugar was exhibited, grown from the Otaheite cane, with which some 17,500 hectares (1 hectare = 2·4736 acres) are planted in this state.

Preserves.

Of other kinds of food products were honey, chocolates, vanilla, and preserves of "Guanabono" fruit (*Anona muricata*) or sour sop, Guava (*Psidium guava*), and "quitten" (*Cydonia vulgaris*). The pulp of the Anona, when properly ripe, tastes something like clotted cream and sugar. The fruit is about the size of an artichoke.

FRANCE.

France did not offer any great novelty or variety in her collection, there being only 19 exhibits of cereals and roots. Several indeed were rechauffés, the latter bearing evidence that they had performed the same rôle at Havre, Lyons, and Paris Exhibitions.

Cereals.

The cereal display is disappointing, considering the natural advantages of the country, which possesses 50,000,000 hectares, viz.:—

Natural pastures - -	5,000,000	hectares.
Vineyards - - -	2,000,000	,,
Gardens and orchards -	2,000,000	,,
Arable land - -	25,000,000	,,

These last are apportioned as follows:—

Wheat - - -	6,500,000	hectares.
Meslin and Rye - -	2,500,000	,,
Barley, Maize, &c. - -	2,500,000	,,
Oats - - -	3,000,000	,,
Roots - - -	1,500,000	,,
Vegetables - - -	500,000	,,
Fallow - - -	500,000	,,

Of the cereals exhibited in the French Agricultural Hall, the greater part came from the Pas de Calais, Puy de Dôme, Rheims, the Seine and Marne Departments, &c.

The Pensioners of the Christian Doctrine at Rheims sent an excellent collection of vegetables, such as peas, beans, beet, and potatoes. Chestnuts were also shown—an important produce, of which 1,073,402 acres are planted—of potatoes, 2,469,634 acres.

Beet.

M. Simon Legrand, of Pont a Marcy, Nord, was conspicuous for his beet root seed, which has been furnished in large quantities to one of our few English growers, Mr. Campbell of Buscot Park, near Farringdon. The improvement in the farming capabilities of France during the last 20 years was everywhere shown, and particularly in the attention bestowed on the fattening of stock.

Cattle.

According to the latest statistics there were—

Cattle	- 12,733,188, or	3	to every	100	inhabitants.
Sheep	- 30,386,223 „	800	„	1,000	„
Pigs	- 5,789,624 „	155	„	„	„

Insufficient food for population.

But, according to Dr. Cenveilhier (see Lord Brabazon's Report of 1872 on the condition of the working classes), the population of France is very insufficiently nourished, the average consumption of each being only 4 cwt. 1 qr. 9·017 lbs., instead of 6 cwt. 1 qr. 14·297 lbs. of dry food. This consumption corresponds to 44 gallons of wheat, 22 gallons of barley or rye, 75·018 lbs. of meat, and 80·577 lbs. of potatoes. Certainly this is far larger than the average of the last century, but it is not nearly sufficient, and it would seem as though the insufficiency was more likely to increase than decrease. In the 71 exhibits of Group IV., it is surprising how little was shown in the way of flour, considering the speciality of good bread making, for which France is famous.

French milling.

The "gruaux" principle of grinding (introduced by M. D'Arblay), is largely in use, causing a great saving of the finest and most nourishing portion of the flour. By this process, any flour is made to contain more or less gluten in proportion to starch. The grains are first ground high in the mill, the white middlings being separated in coarse sieves and reground: and the flour is repeatedly passed through very fine silk sieves.

Mauprivez, of Paris, and Louit, Frères, and Co., of Bordeaux, exhibited tapioca, sago, and arrowroot, in certified packets, which, considering the hygienic value of their meals, is a sensible and politic way of proceeding on the part of respectable firms.

Compressed foods.

The old liking for the "pot-au-feu" is frequently shown indirectly. E. Masson of Paris, and the Compagnie Française d'Alimentation were conspicuous for their marbled cakes of dried and compressed vegetables, containing upwards of 40 different kinds, thoroughly mixed and incorporated to an homogeneous mass. They also take a leaf out of the invader's book with an imitation of the "Erbs-wurst," in the shape of pea sausage, packed in square papers, with a handsome photograph. From the directions on the label, however, the preparation would seem to involve more time than that of the German "wurst." The first named exhibitor showed a new application of Indian corn, as Maize malt for brewing.

Articles "de luxe."

Preserved luxuries were well shown, such as asparagus, peas and artichokes, put up in glasses, and also in tin cases "marinés" or preserved in water. F. J. Chevet, of Paris, had a luxurious selection in the shape of immense salmon in tins the size and shape of the fish, with bottled truffles preserved in champagne. Boyer, Heigl and Cie. showed an appetizing group of perigord truffles, while others sent "petits pois," "haricots verts," &c. E. Masson also exhibited a number of little black threads like scraped isinglass, as a new preparation of tomatoes called "Heliosine."

NICE.

Cereals.

Nice was a large exhibitor in the French department, partly in cereals, but principally in olives and olive oil. The acreage of wheat in Nice is about 40,000 with an average yield of 10 bushels to the acre, of oats 9,340 acres, and of barley 6,250. Indian corn is also extensively grown and consumed by the peasantry.

Olives.

But the olive is the great speciality of Nice. More than 15,000 acres are planted with this tree, producing on an average 180,000 to 200,000 gallons of oil. The tree grows well even at great elevations above the sea, and will stand 10 degrees of cold; but the produce is uncertain, on account of the length of time which the fruit remains on. The olive tree grows slowly and yields no crop until it is 20 years old. The olives are collected about December by beating the trees, a mode of treatment that bruises the fruit and injures the quality of the oil; in fact, neither olives nor oil are ever so good as when picked by hand. There are 168 oil mills in the district. Ten gallons of good olives will yield 1 to 1½ gallons of oil, but the average quantity is about 10 per cent. Generally speaking, each tree yields 50 to 150 kilo. of olives, but the harvest is very uncertain. There are 5 kinds of olive trees principally cultivated in the South of France, viz., Verdale, which yields good oil and makes a good conserve; Blanquet, with a particularly sweet and delicate oil: (these two have low growing branches, which enables them to be picked by hand); Bouquettier, a very superior oil; Redounaon, which stands cold well; Olivier de Grasse, yields excellent oil, but grows high and is not so well adapted for picking.

FRENCH COLONIES. ALGERIA.

Cereals. The French Colonies were remarkable for their complete collections and the beautiful manner in which they were arranged. Algeria was especially conspicuous for cereals, vegetables and fruits. The wheat is of splendid quality, although it is singular that in spite of the natural richness of the soil, the average yield of the grain under European cultivation is only 8 or 9 bushels to the acre. The average production of the colony is 12,500,000 hectolitres (1 hectolitre = 22·0097 gallons). Algerian wheat, especially the hard wheat, is much in request for macaroni, vermicelli, and all kinds of pâtés for the English market. The gluten, which is essential for the transformation of the wheat into macaroni, exists here in greater quality than in any other wheat, even that of Taganrog and Sicily. Barley (*Hordeum hexastichum*) is very generally cultivated and most productive. The poorer classes eat it, and it is considered well adapted for malting. The hard wheats, barley and oats are grown principally in the departments of Oran and Constantine, which contributed also maize, millet and Hungarian "Moha" (*Panicum Germanicum*). **Vegetables.** The vegetable products included French beans, peas, chick pea or gram, the *Sechium edule* or "choko," (which is used as a substitute for potatoe,) sea-squills, yams, bananas, and patatoes.

Fruits. Amongst the fruits the dates were the most conspicuous, there being at least 55 varieties in this colony, though mostly small, dry, farinaceous and not much larger than an olive. They are varieties of the *Phœnix dactylifera* and are a staple food of all classes. The Algerian date best known in England is called "Beglet nour," and is attached to the stalk; but there is another kind also, which is unattached. Amongst the fruit curiosities was the fruit of the Zizyphus Lotus, which is pounded in a mortar and made into cakes; also the *Carica papaya*, which is said to have the singular property of making meat tender, that is exposed to its influence.

Couscousou. Another exhibit peculiar to this colony was "cousсousou," in reality, only the semoule of the hard wheat, though it forms the basis of a very national dish, cooked with a most appetising conjunction of fowls, mutton, butter, red pepper, and vegetables *ad libitum*.

Exports. The following statistics of exports for 1869 will show that Algeria is an important food-producing colony:

Cattle - - -	23,443
Sheep - - -	351,451
Lard - - -	500,000 lbs.

Fish - - -	3,250,000 lbs.
Wheat - -	128,700 qrs.
Barley - -	102,800 „
Flour - - -	76,700 cwt.
Bread - -	240 „
Dry Vegetables -	1,600,000 lbs.
Fresh „ -	2,500,000 „
Olive oil - -	1,800,000 „

French Colonies. The other French colonies were very similar in their exhibits, which consisted principally of coffees, cocoas, spice, and sugar. Martinique, Guadaloupe, Guiana, Mayotte, New Caledonia, French India, and Cochin China, all sent more or less lavish displays of these specialities. Senegal and Reunion had also spices and honey, while Tahiti exhibited dried mushrooms, and a species of Hirneola largely exported as a food to China.

SPAIN.

Fruit. Spain and Portugal will not detain us long, as most of the exhibits of these countries belonged to wines and spirits. From Spain the principal food objects were preserved oranges, such as mandarins, Seville, "Vas bigaradia," with thick rinds and rugged surface, the forbidden fruit, and a large sort of shaddock (*Citrus decumana*), called there "narenja." It is almost needless to mention the enormous trade between this country and Spain in oranges and lemons, the produce and exportation of which from Malaga has doubled within the last four years. From Corunna came fine preserved strawberries, capers from Majorca, preserved fruits and white loaf sugar of rather coarse appearance from Barcelona. The manufactured foods were still more meagre, and consisted of marmalade from Lisbon, sugar plums, macaroni, and little hard-baked rolls of sea-biscuits from Valencia, chocolate from Astorga and Madrid, of particularly poor quality, considering that the Spaniards are great chocolate drinkers and take nearly the whole of the Venezuela supply of cacao. Lerida sent little cheeses, like the Dutch but smaller, also some honey which certainly had the merit of cheapness, being marked at 15*d.* the kilogramme, or barely 6*d.* per lb. As regards the Spanish colonies, the Cape Verd Islands sent arrowroot, coffee, and enormous haricot beans. Considering the disorganised condition of Spanish trade and agriculture, it is creditable to that country to have sent any exhibits at all to Vienna.

PORTUGAL.

Cereals.

In Group II., Portugal sent some excellent samples of maize, cobs and grains of great size, the former being the most cultivated and productive crop in the kingdom. The following table shows the extent of the cereals:—

	Hectares.		Hectares.
Wheat -	250,500	Vegetables -	31,499
Maize -	5,600,000	Potatoes -	13,499
Barley -	700,000	Olive yards -	42,000
Rye -	2,400,000	Vineyards -	189,409
Oats -	200,000	Chestnut Woods -	12,436
Rice -	150,000		

There was a very extensive and well arranged collection of all kinds of vegetable produce, principally in its raw state. Among them were very many varieties of coffee, from the large and symmetical pale berries of St. Goa or St. Thomas to the little dark Bembé coffees.

Fruits.

The models of tropical fruits, and especially of the edible plantain and bananas, durian, mango, and other delicious tropical fruits, suggest reflections as to why they are not imported in ice to Europe. The size of the almonds, walnuts, and Brazil nuts, was far larger than those we ordinarily see in commerce.

Johannes-brod.

Amongst other fruits worth mention was the large dark coloured fruit called in Portuguese "Algarobas," and in Austria "Johannes-brod," a great resource to the poor, who eat it in large quantities, particularly in Lent. It contains a good proportion of sugar and is very nourishing and satisfying, besides being cheap, and having the virtue of keeping well. In Vienna it is sold at all the fruit stalls in the streets.

Biscuits.

There was but one exhibit of biscuits, which were pulpy and uninviting, though they had the merit of having English names spelt in Portuguese fashion, such as *Nic Nac*, *Snov Drop*, &c. From numerous samples of marine and rock salt, this would seem to be an important branch of Portuguese industry.

Food of peasants.

Apropos of the food question, I may mention that the Portuguese peasant is by no means robust, and shows a want of sufficient nourishment, especially as he is frequently exposed to miasma. His natural vigour is stunted by too much vegetable diet, such as beans, peas, chick peas, &c., which, with pot-herbs, rice, chestnuts, and scanty rations of fish, form his chief food.

AZORES.

From the Azores came some splendid specimens of preserved oranges, St. Michaels, Tangerines, and Mandarins. In 1751 only three boxes of oranges were shipped to Europe, an amount which by 1872 had increased to 266,385. The Azores also contributed yams, pepper pods, and melons.

ITALY.

Cereals.

Italy sent a large collection numerically of cereals and food grains, but individually they were insignificant, and seldom approached the magnificent qualities of Portugal. Most of the exhibits were contributed by Alessandria, Bari, Salerno, and Catania, in the shape of wheat, barley, millet, oats, maize, aud beans. Although from all parts of the kingdom there were exhibitors in this section, by far the largest share came from North Italy. In the southern provinces indeed the most valuable cultivation is that of arboreals, such as olives, carrouba beans, figs, oranges, lemons, grapes, and mulberries, while Tuscany may be said to yield the largest agricultural produce.

Rice.

From Mantua, Pavia, Treviso, Venice, Verona, Bologna, Lucca, and Ancona, came numerous exhibits of rice, the cultivation of which has greatly increased of late years in Piedmont and Lombardy. In Group IV. there was a most interesting display of manufactured foods, in which I observed several Italian specialities.

Chestnut meal.

A great many flours were shown, principally of wheat and maize, also chestnut flour, and one from Turin of lupins and chestnuts combined, said to be very nutritious. Chestnut flour, so unknown to us in England, although there is no reason why this should be, is the staple food of many Italian peasants, with which they make their polenta, preferring it to maize as being more nutritious. The cost per head of this kind of food is from 3*d.* to 4*d.* per day. The chestnut is also used in the whole kernel for soup, while in some districts the flour is baked like oatcake. A quantity of chestnut leaves is collected from the trees, the meal being mixed with water, and the leaves placed on a hot iron plate to receive the dough. It is then covered with another layer of leaves, and a hot iron plate placed over the whole.

Babies also participate in the advantages of chestnut meal, and are said to thrive remarkably well on pap made from it. There can be no reason why chestnuts should not be more used in this country. Railway communication exists all the way from the chestnut districts of Italy; and our wheat flour might be supplemented with great advantage by chestnut flour, while, as a delicacy, the nut is capable of far more treatment than the simple roasting, which is all that we know about it.

Macaroni.

The display of macaroni was very large and curious, principally from Naples, Salerno, and Palermo. Not only was it shown in the ordinary tubes with which we are so familiar, but in every possible shape, such as hanks like silk, little buttons, seeds, pipes, threads, and snow flakes. One reason, perhaps, why macaroni is such a staple dish, is because a great deal of the Italian wheat is not suitable for breadstuffs. That of Cagliari, in Sardinia, is eminently unsuitable, being too hard, and is, therefore, entirely used up in macaroni and polenta. It is the same in Sicily, though the macaroni in that island is said to cause calculus diseases. This may arise from the fact that the millstones used in grinding the Sicilian wheat are very friable and allow a large proportion of pulverised stone to escape into the mixture. Genoa is a great seat of the macaroni trade, but it is singular that the largest portion of it finds its market in Buenos Ayres.

Biscuits.

A rather large show of biscuits was sent by Somma, of Naples, but for colour, crispness, and preservation of outline, they were far inferior to English biscuits.

Confectionery.

Judging by the exhibits in ornamental pastry, the Italian confectioners must have been on their mettle, for many of them were exceedingly clever, although of somewhat singular design, such as mandel (almond) tart in extraordinary shapes of fishes and conger eels; vanilla tart, in little imitation stone baskets with napkins carelessly thrown over them, both basket and napkin being made in sugar.

Sugar.

One artist had evidently determined to outdo the rest in originality, for he had modelled a series of elaborately worked sugar shirt fronts, studs, and ties. The raw sugar industry seems to have taken a stand of some importance at Arezzo, whence Sig. Braubach sent a collection of beetroot sugar from his factory, which is capable of working up 100,000 kilos. of beetroot daily. From Turin I observed sugar made from a kind of sorghum (*Holcus saccharatus*). The industry of meat, fish, and vegetable preserving appears to be making a beginning, as there were several exhibits of sardines and preserved tunny-fish, on which a large proportion of the Sicilian coast population lives; also pork sausages from Bologna of immense dimensions, packed in tin-foil and very portable, while Milan sent preserved butter and "grano" (Parmesan) cheese.

Fruits.

The fruits were perhaps the most interesting of the Italian exhibits. From Sicily came oranges; from Tuscany candied citrons. Sicilian lemons, which were formerly very plentiful, have been getting scarce of late years, and the island can with difficulty supply the demand from the United States, which is always large. The consequence is, that prices have risen considerably, and essence of lemons, which used to be 8*s.* per lb. is now 19*s.*; while boiled lemon juice is nearly double its former price. Leghorn was the great seat of the candied citron trade, about 5,000 boxes (1,000 to 1100 tons) being exported in good seasons. But the trade has declined for this reason: only refined sugar was used, and as the Government does not now allow a sufficient drawback in this article, more sugar is lost in making the citron than is allowed for.

Olives.

Olives and olive oil were well shown. I have already alluded to the olive districts of Nice. The south of Italy appears to be reaching the same importance in this trade, 800 tons of olive oil having been imported into England in 1871, from Brindisi.

Fruit models.

The most conspicuous object in the fruits was a splendid series of models by M. Garnier-Valletti François, who, with uncommon perseverance, had modelled upwards of 2,300 varieties of apricots, almonds, cherries, quinces, figs, strawberries, raspberries, pomegranates, gooseberries, medlars, peaches, pears (603 kinds), apples, plums, grapes (787 kinds), the originals of all these fruits having been grown in the extreme north of Italy. The object of the exhibition was to show that many fruits supposed to be peculiar to southern countries, can be cultivated equally well in temperate climates. However that may be, this collection was certainly unequalled in the Exhibition.

SWITZERLAND.

Switzerland made but a small show in cereals; her great strength lying in preserved milk and chocolate, in both of which industries she has obtained a well-deserved reputation.

Cereals.

In wheat cultivation, the canton of Lucerne stands foremost, followed by Aargau, Zurich, Berne, Solothurn, Basle, Schaffhausen, St. Gall, Freiburg, and Geneva.

Dried fruit, oats, and tobacco were the representatives of Group II., while in prepared foods were Zweiback (rusks), and cheeses from Emmenthal, identical with the Gruyère, so well known in England, and in such great favour throughout Germany and Austria. Indeed at every restaurant throughout the land, unless any special cheese is ordered, "Emmenthaler käse" is certain to be brought.

Cheeses.

Condensed milk was very extensively shown, and particularly by the Anglo-Swiss Company, which has been established at Cham, in Zug, since 1866, and has subsidiary factories at Gossau and Freiburg, as also an English branch at Chippenham, in Wiltshire. The Anglo-Swiss milk is well known in this country, and has a large continental trade, turning out in 1872 upwards of 3,500,000 of one pound tins. Condensed milk was also shown by the Alpina Company, whose factory is at Luxburg, Thurgau, by Giavelli, Faido, and by Dr. G. Schroder, of Thurgau. At least 20,000 quarts of milk are daily condensed in Switzerland, of the value of 4,000*l.*, the greater part of which goes to London.

Condensed milk.

Guberthuel, Geneva, exhibited coffee extract and essence of acorn, intended as a substitute for the flavour of coffee. When properly prepared, acorn coffee is said to be useful for delicate children and persons threatened with phthisis. The acorns should be collected when perfectly ripe, peeled, thoroughly dried and roasted like coffee.

Acorn coffee.

A kind of "wurst" was shown by M. Quillet, of Vevay, termed by him "economical food for poor people, sailors, and travellers." It was composed of various grains and vegetables, such as rice, peas, groats, beans, maize, toasted bread, vermicelli, tapioca, macaroni, &c., yielding with three-quarters of a pint of water a good soup in 20 minutes for 40 centimes. It did not appear, however, to differ in any essential point from the portable soups exhibited in other countries.

Preserved foods.

The show of chocolates was very fine, particularly on the part of M. Ph. Suchard, of Neuenburg, one of the largest chocolate makers in Europe. The factory was originally started by his father in 1826, but since the introduction of railways, there has been such an accession of trade, that M. Suchard has now eight large factories, producing 1,000,000 lbs. yearly. In addition to the ordinary chocolate samples, he exhibited some ingenious trifles in the shape of chocolate albums and picture boxes. H. Goll, Lausanne, showed chocolates, for which he claimed absolute purity, together with some new confectionery, such as pine kernel and almond kernel chocolate. Cailler & Cie., of Vevay,

Chocolates.

exhibited hazel-nut chocolate. The following statistics of Swiss consumption are taken from the "Schweizerischer Katalog."

——	Import in 1871.	Export in 1871.
	Francs.	Francs.
Wheat - value	63,480,295	1,401,038
Coffee - - -	20,641,940	1,706,430
Sugar - - -	18,082,800	857,760
Butter - - -	6,103,180	1,704,280
Flour - - -	4,435,950	2,061,075
Rice - - -	2,117,449	102,994
Dried fruits - -	2,099,400	—
Hams and Bacons -	1,541,760	1,291,730

BELGIUM.

Cereals.

Of all the countries exhibiting in the food group, *Belgium* sent the least, and particularly in the matter of grains. This is singular, as Belgium is a considerable grain producing country, cultivating—

Cereals - -	947,578	hectares.
Vegetables - -	38,285	,,
Hops and chicory -	76,993	,,
Roots, &c. - -	335,762	,,

Spelt.

The principal crops of the cereals are vegetables and rye, wheat, oats, barley, buckwheat, hops, chicory, beetroot, potatoes, turnips, and "spelt," a cereal which is coarser than wheat, but produces a more palatable flour than rye. There were several exhibits of chicory from Brussels and Ghent, the latter district exporting it, together with hops, largely to England. Belgium sent also a few meat extracts, some chocolate and cocoa butter from Doornik, and a capital collection of table biscuits of various kinds, exhibited by C. L. Vaud, of Ghent, the next best after England. Altogether the Belgian show was a very poor one, and far inferior to that of her neighbour

HOLLAND.

Cereals.

Holland cannot be said to rank highly as a food-producing country, although she certainly has a deserved reputation for food preserving. But few cereals were exhibited, though there was a good deal of suggestiveness in a collection of samples grown on what was once the Haarlem Meer. Improved machinery and powerful pumps have drained this great waste of water, and it is now one of the best farmed and most productive districts in Holland. Indeed, all "polders," as these drained lakes are called, are most valuable food-producing lands, growing wheat, oats, rye, buckwheat, potatoes, carrots, turnips, and chicory.

Cheeses. Of other agricultural produce, there were Dutch cheeses in profusion, of the kinds called Edammer and Leitze, and made in 1872. They did not, however, strike me as having kept particularly well, being somewhat soft and liquescent. The samples of hops were remarkably good.

Butter. Anatto cheese coloring was extensively shown, as also Dutch butter, both in curious little stone jars, resembling blacking bottles. Unattractive as was the exterior, the goodness of the Dutch butter is well known, it being very seldom adulterated, from the fact that it is too expensive for the lower classes, and only used by those who are tolerably well off. It must be understood, that I am speaking of genuine Dutch butter, the produce of the country, and not of the English butter, an inferior and adulterated article which is sent over from this country to be re-imported with a reputation of purity borrowed from our neighbours. Some small corrugated-looking potatoes attracted my attention, as they resembled truffles more than anything else, and were labelled Leewsche Jan Ardappel.

Bread. Of manufactured foods, two large tubs of a superior kind of ship's biscuit were the principal meal exhibits, and also a piece of white and light bread baked from meal, shown at Paris in 1867. The food of the Dutch labourers, and indeed, very much also of the middle classes, is principally black rye bread, eaten between two thicker slices of brown, or white. The difference of the two appears to be more in the baking than in the difference of the flour, the hand-made or white bread being left in the oven for 24 hours, while the black or machine made is left for 48 hours.

Tinned foods. The tinned provision trade is evidently firmly established in Holland, and embraces vegetables of various kinds, samples of which were exposed in glasses of water, looking fresh and bright, large bottles of sardines and herrings shown by Betz and Van Heyst of Vlaardingen; ship foods in great profusion by Nieuenhuis of Amsterdam; fried flounders and preserved buttermilk by Surie & Co., Rotterdam; fruits and vegetables, salt fish and prepared salads by Van Ellekom, Amsterdam. There was a business-like look about all these exhibits, which begat confidence in the contents. Apropos of meats, I may mention a curious and rather unpleasant-looking plaster cast of the morbology of rinderpest, which nevertheless, should be of great value to the agricultural student.

Chocolates. The display of chocolates was very good, particularly those of Veen & Co., of Sneek, Van Houten, of Weesp, and Groots of Westzaan. The latter showed every kind of cacao from Trinidad, Puerto Cabello, Caraccas, Maranham, Guyaquil, Surinam and Grenada. Cocoa butter also figured here, obtained by compression between two heated metal plates, so that all the colouring matter exudes, leaving stearine with a little oleine, of an agreeable taste and odour.

SURINAM.

Of the Dutch Colonies, *Surinam* exhibited sugar, coffee and cocoa, of which produce she exported in 1871—

	lbs.
Sugar - -	23,709,797
Coffee - -	8,190
Cacao - -	1,093,394

JAVA.

Java was represented in a most complete manner, and was in every respect a very attractive portion of the Exhibition, samples of nearly all the Java products having been sent. Of cereals, maize is cultivated pretty largely, though scarcely enough for export.

Rice. The rice grown here supplies the whole Archipelago, the export being annually 250,000,000 lbs. The production of rice is enormous, but it cannot be got at by statistics, as the whole population, not only of that island, but of the Archipelago is almost entirely supported by it. So also is the sago, which is the mealy sap of the sago palm (*Metroxylon sagus*), most extensively used for food.

Sago.

Coffee. The specimens of coffee were very fine. It was originally introduced into the island from Abyssinia in 1723 by Governor Zwaardekroon, and the export is about 125,000,000 lbs. It grows in the temperate zone of Java, at an elevation of 3,000 to 4,500 feet, on forest clearings, with sufficient trees left to protect the coffee bushes. The coffee leaves are largely used in Java (as stated by Professor Blume of Leyden), and also throughout the entire Archipelago, as an infusion, instead of the berries.

Coffee leaves used.

Tea. Tea also grows well at an elevation of not less than 3,000 feet, but the quality is inferior, somewhat resembling the Assam teas in flavour, but without anything like their strength. The average export is 1,740,000 lbs. It finds a ready market in Holland for first sale, but the flavour is not liked there, and it is therefore passed on to England, the Dutch taking Chinese tea in return for their own use.

Sugar is a staple article of manufacture, the export being 212,000,000 lbs., but the cultivation has many drawbacks, such as the want of skilled labour for repairing machinery, the frequency of floods during the rainy season, and the tax by the terms of which all sugars must be made of certain numbers. But these sugars are very suitable for refining purposes, and are eagerly bought by America. Fine white crystallised sugar was exhibited by Van Dolder, obtained by filtration and centrifugal process, though not so large and clear as those of Mauritius. "Arenga" or palm sugar is obtained from the *Arenga saccharifera*, which furnishes the palm wine, the real original "toddi," but this sugar is only made to a limited extent. Cocoa (*Cacao Theobroma*) appeared both as the fruit and the manufactured article; peppers also, both black (*P. nigrum*), and the long pepper. Of spices there were cloves (*Caryophyllus aromaticus*), nutmeg (*Myristica fragrans*), cinnamon, and the betel (*Piper betel*) a creeper of the pepper genus, the leaves of which have a pungent taste, which is much liked by the natives, who chew it, accompanied by a preparation of lime and betel nut.

Sugar.

Betel.

The furnishing of ship's provisions is a great trade in Java, but it is crippled by the high price of salt. But for this, pickled pork might be had almost for nothing; but as it is, the wild pigs are almost a nuisance, for the population being Mahommedan, and the animals regarded as injurious to the sugar cane, their carcases are thrown away. This is the more to be regretted, as the feeding on the cane imparts a peculiarly delicious flavour to the flesh. The other animal foods in the island are those of buffaloes, which taste like venison, though rather tough, deer, and wild geese, which appear in immense flocks.

Ships' provisions.

Very conspicuous in the Java exhibits were the cocoa-nuts, the fruit of the *Cocos nucifera*. This, however, is not the only edible product of the tree, for the top forms a sort of cabbage called "palmiet," which is considered a delicious vegetable, while from the palm wine an inferior sugar, like the "arenga" is made. The fruit of the Malay "pisang" (*Musa paradisaica*) and the bread fruit tree (*Artocarpus*) were also shown, together with the betel-nut (*A. catechu*) from the Penang palm, which is often chewed with the betel. By fermentation of the sap with rice the spirit called "arrack" is procured. Edible birds' nests (page 19) were exhibited, of which there is an annual export to China of 125,000 lbs. (Dutch) (1 pound Dutch = 2·2057 lbs.)

Cocoa-nuts.

The preserves of tropical fruits, such as tamarinds, "rambotan," mango, &c., were badly made, as they all ran into a jelly in the bottle. There was, however, a good series of

Preserves.

Fruit.

models of the Java fruits, such as "Kanari," a kind of almond, "Assam Djawa" or tamarinds, "Mangistan," "Rambotan," "Nangka" or bread fruit, "Doerean" or durian, which rejoices in the most revolting smell, although it is nice enough when once tasted, "Djeroek" (oranges), "Dalina" (pomegranates) "Pisang" (bananas) "Nanas" (pineapple), "Papaja" (melons), and "Pinang" (areca). All these grow in the hot zone, below an elevation of 2,000 feet. In the temperate zone are coffee, tea, potatoes, cabbage, celery, artichokes and other European vegetables; in the cool zone (from 4,500 to 7,500 feet), oaks, laurels, chestnuts, cedars, rhododendrons, and azaleas; and in the cold zone (7,500 to 10,000 feet), there are no traces of cultivation, although the wild oak apple and strawberries are sometimes found at this height.

We next come to the Scandinavian kingdoms, where we have a very different state of food products from the eastern archipelago.

DENMARK.

Cereals.

Denmark, as might be expected, did not exhibit in great profusion. F. Wendt, of Roskilde, had a good series of 125 varieties of cereals, whilst Beauwais, of Copenhagen, sent preserved meat, fish, and fruit. There were several samples of preserved butter, which, like the honey, looked very tempting. The following are the latest statistics of Danish produce:

		Tonder.	
Wheat	occupied	95,876	(1 tonder = about 1½ acres).
Rye	„	414,656	
Barley	„	546,549	
Oats	„	660,912	
Buckwheat	„	35,971	
Peas	„	66,902	

Cattle.

While of live stock there were—

Horned cattle - -	1,193,861
Sheep - - -	1,875,052
Pigs - - -	381,512

The cattle are mostly of two breeds—the Jutland, which makes the best butchers' meat, and the Angle, or Holstein, which are the best milkers. So celebrated are they for their performances, that there is a proverb which says, "The Angle cow gives her last fibre to the milk pail." Danish wheat, especially that from the districts of Lolland and Moen, contains more gluten than English wheat. The ordinary yield per acre is 28 bushels, while the barley is much liked by maltsters.

NORWAY.

Except in the matter of fish, the Norwegian contribution to the food products was almost as barren as that of Denmark, which is not to be wondered at, considering that 19-20ths of the country is rock, growing nothing but pine trees, moss, and a little grass.

Cereals.

From Christiana came the only exhibit of grain, the amount grown annually in Norway averaging:—

Wheat	2,816	quarters.
Rye	8,850	,,
Barley	62,700	,,
Other grains	38,000	,,
Oats	18,600	,,
Peas	5,000	,,
Potatoes	277,400	,,

Cattle.

Even here I found preserved meat and vegetables and condensed milk, showing how universally the "preserving" characteristic of the age has prevailed. The live stock of Norway consisted of (by the latest tables):—

Oxen	949,935.
Sheep	1,596,199.
Goats	357,102.
Pigs	113,320.

Meat, or rather fresh meat, is but seldom eaten, the animals being killed at the beginning of the winter and salted down; but even in this condition it is by no means a common article of food. A specially built wooden chalet in the Norwegian style contained a very interesting collection of all kinds of nets and implements used in the fisheries, which may be said to be the staple employment, and yield most of the food of the country. Here were to be seen, either preserved in spirits or in a dried state, the salmon, which is (or used to be), so abundant in Norwegian rivers, the cod, the capelin, and several others, together with fish roes from Christiana, and anchovies from Friederichshald and Bergen. The produce of the Loffoden fisheries in 1871 was—

Fish.

	Klip fish	750,000	vogs (1 vog = 44 lbs.)
	Round fish	340,000	,,
Yielding	Oil	31,000	barrels.
,,	Roes	25,000	,,

The cod is partly dried, when it is called stock fish, and partly turned into Baccalan. After the roes and cod liver oil are taken away, the heads and backs are made into artificial guano. On an average about 400 cod yield one barrel of liver, varying in price from 1*l.* to 1*l.* 6*s.* 8*d.*

Capelin. The capelin (*Mallotus Arcticus*), is a small fish of the Salmonidæ family, which is generally caught about March, and, as it is generally followed by shoals of cod, it is probable that the latter feed upon it. At any rate it is an exceedingly nice fish, and it is to be regretted that it is not more often brought to England. It may not be out of place to mention one fact in connection with the universal fish diet of Norway, viz., that it is said to produce leprosy of an exceedingly obstinate type.

The flours and meals of Norway were not represented. Bark bread or meal has disappeared from use, but I was sorry not to see samples of the fläd brod, which is so commonly eaten.

SWEDEN.

Fish. Like Norway, Sweden had its specially appointed fishing house, which contained a very large collection of everything in use for that industry. It was a repetition of the other, but on a much larger scale, and appeared to contain every variety of salmon, dried, smoked, pickled, and preserved, as also herrings and anchovies in countless profusion.

Cereals. The exhibits of cereals were some 70 in number, from Sulea, Gefle, Upsala, Stockholm, Falun, and Orebro, although there were none of any great excellence. In the far north of Sweden, barley is the only cereal. Sometimes a few potatoes are grown, and these with salt herrings and salmon stored up, make the winter's food. Meat is seldom seen by the peasantry, and then only in the form of salted pork.

Reindeer moss. As a speciality of Sweden, there was an exhibit of reindeer moss, which makes a very nutritious jelly, and has also another economic use, discovered by Professor Stenburg, of Stockholm, viz., the yielding of alcohol and brandy by distillation. In a food point of view, this is valuable, as other grains now used for distillation would be set free for food. The chief articles shown in Group IV. were chicory, chocolate, and biscuits from Upsala, and beetroot sugar made by a company at Landskrona.

GERMANY.

The food exhibits in *United Germany* were very numerous, so much so indeed that it is out of the question to particularise in any way, and I shall deal only with the leading facts of the main industries. This is the more easy, as so many of the exhibits were collective exhibits (*Collectiv-Ausstellung*) sent by a district or a trade.

Population. It may not be out of place to give a few general statistics regarding the German produce. The population is now about 41 millions, or 3,805 to the square mile. People are not so thick on the ground as they are in Belgium, where the proportion is 9,511 per square mile.

Cereals.

The average cereal produce is—

Rye	-	94,000,000	hectolitres (1 hectolitre= 22·0967 gallons.)
Oats	-	87,000,000	„
Wheat	-	34,000,000	„
Barley	-	30,000,000	„
Spelt	-	15,000,000	„
Potatoes	-	272,000,000	„

Live stock.

equalling 6⅓ hectolitres of grain and 6¾ hectolitres of potatoes per head of the population. Of live stock Germany possesses—

3,500,000	horses	or	349	to the square mile.
15,000,000	cattle	„	1,530	„
30,000,000	sheep	„	2,943	„
8,000,000	pigs	„	813	„
2,000,000	goats	„	208	„

The export of live sheep to England is declining, as shown underneath.

1865	-	-	-	267,279
1866	-	-	-	276,093
1867	-	-	-	188,445
1868	-	-	-	115,720
1869	-	-	-	201,923

Milling.

The exhibits of flours and meals in the German Agricultural Hall, was a very extensive one, and it is interesting to note the great changes that have taken place in the history of millers' goods since 1820, at which date they began to apply more technical and rational processes to this industry, from having observed the great difference in the quantity and quality of the work turned out by the improved English and American corn-mills. For a long time prejudice and the privileges of the old Bann-mühle—(the mills of communities, which involved a monopoly), narrowed the sphere of the utility of the improved methods, but though they lengthened the struggle, they could not prevent their being finally planted throughout the country. In North Germany, Prussia has the merit of introducing the first improved mills (including steam mills) about 1825, followed by Wurtemburg and Bavaria in 1830, and subsequently by Saxony and the other German states. This may be described as the first period of the new German corn-grinding system, and extends to about 1835. The second period commences with the appearance of the Swiss roller-system (Walzen-mühle), and the application of Fourneyron and Herschel's turbines for driving the mills. About 1860, it was perceived that the Walzen-mühle system was liable to two great defects, viz., that it was inefficacious to complete the grinding, and was constantly requiring repairs; and it was therefore abandoned. The third period was characterised by the disputes between the advocates of rival methods, such as between Flach- and Hoch-müllerei (flat and high milling); leaving the upper stone at rest, and allowing the lower one to run; applying the roller system to grit crushing; using Carr's disintegrator for groats and coarse meal. These disputes never led to any very definite results, except that it was soon perceived that gries (grit) milling was better adapted to South Germany, and its consumers of the light breads, and pastries known as "Kipfel," "Nudeln," and "Mehlspeise," rather than for North Germany, which is used to coarser food. The fine meal (Kaiser mehl), it was soon perceived, went further than the more ordinary sorts. The largest corn mill now existing in Germany (working for the export trade) is that of Lange Bros. at Kiel, which has 64 sets of stones in one building. Next in importance come Krietsch, of Wurgen, in Saxony, the Bromberg sea trade mills, and the Stettin Joint Stock Mills. I may here mention that the consumption of flour in towns like Dantzig is estimated at 1 cwt. of wheat of first quality, and double that quantity of rye flour per head per annum. The largest corn mills in South Germany are those of Corell, in Neustadt on the Hardt, May and Co., of Hansen by Frankfort-on-Maine, and the Munich Ludwigs Mill, which was formerly on the Walzen principle. None of these, however, have more than 12 sets of stones. The aggregate number of mills in what was once the Zollverein, in 1864 was 59,118, with 104,405 sets of stones. In connexion with German milling, the manufacture of "graupen" (peeled grain), now exclusively from barley, is important. The largest mills of North Germany working simultaneously with "Gersten-spalt" (barley splitting) machines, is that of Mackersen, Bierbaumsmühle, between Hildesheim and Goolar.

Macaroni.

As regards the meal manufacture (*mehl-waaren*), such as macaroni, threads, &c., Germany has made a successful beginning in competing with her older rivals in Italy, Hungary, &c. The manufacture of wheat starch is also largely increasing, to the exclusion of potato starch, which in spite of its cheapness is unfit for many purposes. The starch usually preferred is that of the Halle Starch Factory.

Bread.

In North Prussia nearly the whole of the lower classes eat rye bread, and also in Wurtemburg, when it costs about 4 to 5 kreuzers (1¼*d.* to 1¾*d.*) per lb. Throughout the greater part of Germany, a large loaf of black bread is usually found on the farmhouse table, to which the inmates help themselves *ad libitum.* In bread making, what is called "Ober-teig," is sometimes used to replace flour, containing 6 to 7 per cent. of coagulated albumen, 4 to 8 per cent. of starch, and 82 to 88 of beer wort. It produces a dough, which is made up with less stiffness and requires more kneading.

Before quitting the subject of grain, I may mention that Prussia contains—

Arable land (chiefly use for cereals)	36,758,715	acres.
Vineyards - - -	31,199	„
Garden land - - -	488,076	„

East Prussia grows rye, peas, buckwheat, carrot, and potatoes, the latter largely used for the distillers, while Pomerania produces rye, oats, potatoes, corn, barley, peas, and beet. The whole kingdom possessed in 1864—

6,061,711 horned cattle.
19,314,667 sheep.
3,242,059 swine.
19,000,000 fowls.

The free states of Hamburg, Bremen, and Lubeck, grow barley, beans, rye, oats, and potatoes. Saxe-Gotha, the same, with the addition of beet, and the Grand Duchy of Baden, as follows:—

Wheat - -	87,231	morgen (1 morgen = 0·8896 acre.)
Spelt - -	237,013	„
Rye - -	112,408	„
Barley - -	153,184	„
Oats - -	136,847	„
Maize - -	7,214	„
Peas and Beans	9,818	„
Hops - -	4,235	„
Chicory - -	3,534	„
Beet - -	7,114	„
Buckwheat -	1,584	„
Turnips -	49,343	„
Potatoes -	202,433	„

Beet-root sugar.

The beetroot sugar exhibit (a collective one) is remarkably interesting, not so much for its intrinsic attractions (for one loaf of beet sugar is just like another) but from the facts connected with the industry. Margraff, a chemist of Berlin, more than 100 years ago, demonstrated the feasibility of obtaining sugar from this source, and was the first to proclaim that beet sugar and cane sugar were identical. But the impetus given to the beet cultivation in Germany arose from the "continental system," and the reprisals of England. The price of colonial sugar rose to an enormous height, and caused the establishment of numerous factories, most of which were founded by incompetent speculators, who were neither devoted to the new industry by any particular liking for it, or possessed the technical knowledge for industrial undertakings. It is not wonderful therefore that the factories disappeared with the end of the continental system, as rapidly as they had sprung into existence. Napoleon I., urged on by hatred of the English, protected and forwarded the interests of the young industry in every possible way. He allotted one million francs and 32,000 hectares of land for cultivation of the beetroot, establishing five schools for theoretical and practical instruction in the manufacture of the sugar. After the fall of Napoleon, beetroot sugar making in Germany came to a stand still, but was kept up in France itself, and underwent many material improvements, such as the use of steam for motive power and animal charcoal for purification of the juice. From 1830 to 1835, we find the beetroot sugar manufacture again making progress on German soil; and since that time it has been developed with astonishing rapidity, colonial sugar having been altogether expelled from Germany, although it was protected by a duty (by no means small); and the empire is now entirely independent of all foreign grown sugars. Besides the improvements of steam and animal charcoal, many others have been adopted; for the expression of the juice, hydraulic presses, centrifugals by Schöttler, Frickenhaus and Fesca, the maceration process by Schüzenbach, and the diffusion process as recommended by Dombach and recently improved by H. Robert; for purifying the juice, the introduction of chalk with carbonic acid by Schalten and Michaelis, and filter presses for extracting the sugar from the dregs by Bodenbender; for evaporation and boiling of the juice, the introduction of the vacuum by Howard and of the Rillieux evaporating apparatus by Tischbein and Robert in 1850, &c. Many scientific instruments have also been brought into play for analytical purposes, such as the polarising instrument of Mitscherlich, or the more accurate one of Soleil, as improved by Scheibler and others. The analysis and valuation of raw sugar was simplified by the Scheibler method of determining the ashes of the sugar by sulphuric acid, and more lately by a process for determining the refining value of the raw sugar, for which the Society of German Beetroot Sugar Manufacturers gave a prize. According to Scheibler, the beet juice constituents yield a beautiful crystalline base called "Betain," and he also proved the existence in it of asparagin, first described by Rossignon. He showed moreover that the substance in beet juice described by Frémy as "Metapectinsaure" is a kind of glucose from which pectin sugar might be derived. All the beetroot sugar makers are now united in a powerful guild or corporation, established in 1851.

Beet trade statistics.

An accurate analysis of each sugar accompanied every sample, and a large map drew attention to the districts in which the industry was carried on, viz., Saxony, Silesia, Hanover, Brandenburgh, Pomerania, Rhine Provinces, Brunswick, Anhalt, Saxe Coburg, Baden, and Wurtemburg, in all embracing 351 factories which work up 45,000,000 centners of beetroot, and produce 3,500,000 centners of raw sugar. The tax on this quantity yields a revenue of 12,000,000 dollars. The following table gives the statistics of the beetroot used in the last 12 years:—

	Centners.		Centners.
1860	34,000,000	1867	51,000,000
1861	29,000,000	1868	41,000,000
1862	32,000,000	1869	50,000,000
1863	37,000,000	1870	52,000,000
1864	40,000,000	1871	61,000,000
1865	42,000,000	1872	45,000,000
1866	43,000,000		

The diminution in 1872 arose from the Franco-German war and the consequent hindrance to all industries. One centner of sugar is produced from 12·07 centners of beet. The increase in the trade is shown better by the fact that in the 10 years, ending 1836, the amount of sugar turned out was only 28,162 cwt., whereas in the 10 years ending 1866 it was more than 4,000,000 cwt. Two years ago—

Pomerania used in the year 1,221,763 (German) cwt. of beet in 8 factories.
Silesia, 5,345,911 cwt. in 40 factories.
Brandenburgh, 3,119,657 cwt. in 18 factories.
Saxony, 24,136,968 cwt. in 141 factories.
Westphalia, 145,913 cwt. in 2 factories.
Rhineland, 1,318,366 cwt. in 4 factories.
Wurtemburg, 4 factories.

As an agricultural economy, it may be mentioned that the parings of the beetroots are used to feed the cattle after the sugar is extracted. As an article of diet, sugar does not appear to be so extensively used as in other countries. The consumption per head in North Prussia is only about 9½ lbs., whereas in England it is said to be 42 lbs.

Coffee-surrogat.

Chicory was largely exhibited, together with a material called "kaffe-surrogat," which is a mixture of dried and pulverised peas, carrots, beetroot, chicory, and roasted rye. It a staple article of consumption in certain parts of Germany, and especially in the Grand Duchy of Baden, where it is boiled and drunk with the addition of milk. In hay and harvest time the labourers take out into the fields a cask containing a strong decoction of "surrogat," which they bury in the ground to keep cool until it is wanted. The consumption of coffee is about 4 lbs per head per annum, while comparatively little tea is drunk, 0·03 lbs. per head.

Erbswurst

Dried meats from Hamburg and sausages from all parts were very common articles, including the army "Nahrungsmittel" in the shape of "Erbswurst" or pea sausages, made of pure fat, which is dissolved in the cooking operation, smoked beef or pork, ground peas, roast onions, salt and pepper; one-third of a lb. of this was dissolved in warm water.

Sausages.

The number of "wurst," or sausages was bewildering to those who were unacquainted with the German love for this style of food, and they were exhibited in immense variety, such as "mett-wurst," "leber-wurst" (liver sausages), "blutwurst" (black - puddings), "hammel-wurst" (mutton sausages), &c. In many country and farm houses, a "Rauch kammer" or smoking chamber is frequently attached, for the sole purpose of smoking sausages, but modern houses dispense with them, and modern science teaches the dubious substitute of brushing the sausages over with pyroligneous acid, so as to give the smoky flavour.

Hops.

The exhibit of hops was very fine, Bavaria leading the way in this speciality. The hop cultivation in this kingdom occupies 51,823 acres, and the system of wire fencing instead of hop poles is gradually spreading, though the drying is still done without artificial warmth. Nuremburg is the chief market for hops for all Germany, and from 60,000,000 to 70,000,000 marks of hops are sold here every year (1 mark 0·5243 lb.).

Salt.

Salt also formed a considerable exhibit. It is worked in many German States and notably in Wurtemberg, where it was a state monopoly till 1868, in Prussia, Anhalt, and Westphalia, where is situated (not far from Pyrmont) the Sparenburg mine, one of the deepest in the world, said to exceed 1,270 metres (1 metre = 3·2809 feet).. The production of Prussian salt in 1870 was 8,092,871 centners, and of the whole of Germany—

Rock salt	- -	8,913,875 centners.
Other kinds	- -	5,745,115 ,,

I must not omit to mention that a separate building was devoted to the produce of Alsace and Lorraine, which to the great joy of the French, met with an untimely end by fire. It was built after the fashion of a Lorraine farm and had inscribed on the archway of the door:— Alsace-Lorraine.

"Halt fest am reich, Bauer,
Es falle suz oder saure."

In the interior of the great barn, was an admirable collection of farming produce, together with a very clever model of a well-known château in that province. Pâtes de foies gras.

Strasburg was represented by its pâtes de foies gras, familiar to all epicures as goose livers fatted to an immoderate size, by shutting up the unfortunate bird in a dark cellar and in a coop too small to allow of any movement. The bird is then stuffed with maize, until the liver attains a weight of 2 or 3 lbs.

AUSTRIA.

The same profusion of display that characterised Germany was still more noticeable in Austria, which, being at home, so to speak, occupied altogether an immense area. As regards the food exhibits, it is impossible to notice them in detail, nor would it be instructive so to do. But some very interesting facts bearing on the European food question are involved in Groups II. and IV., as shown by the Austrian Empire and her heterogeneous people. Few persons are aware of the important part played by Austria, Hungary, Croatia, Slavonia, Galicia, &c., in feeding our country. The empire may indeed be called the granary of Europe. In the Exhibition, Hungary, Croatia, and Slavonia were treated as a distinct division, Austria proper being grouped with Bohemia, Moravia, Galicia, Silesia, Dalmatia, the Coast Land, Carinthia, Styria, and the Austrian Tyrol, an order that I shall follow in my remarks.

Cereals. In Group II., were 107 exhibitors of cereals and natural food products, of which the great bulk were from Galicia and Bohemia; but as a good many of them were the collective exhibits of a whole district, all the remaining countries are included. Galicia is especially conspicuous for its wheats. Bohemia for its hops. The physical conditions of the various portions of the Austrian dominions differ so much, that the circumstances of agriculture are equally dissimilar. In Bohemia, Moravia, and Silesia, the soil is in the hands of large proprietors, who possess in one estate probably 10,000 acres of arable, and 6,000 to 10,000 of woodland. Some of the estates indeed are as large as 60,000 acres, such as those of the Archduke Albrecht in Silesia, the Prince Schwarzenburg, or the Prince of Coburg at Murany. The average extent of the peasant proprietors is only from 15 to 20 acres. In Upper Austria, however, the peasant owns larger holdings, such as from 40 to 60 acres, while again in the lowland districts of Styria and Carniola, they are very small. In Galicia, three-fourths of the country are in a few hands, the proprietors varying from 1,000 to 20,000 acres. As regards produce, the Cis-Leithan provinces yield large quantities of corn; Bohemia, Austria proper, Moravia, and Silesia, corn, rape, hops, potatoes, turnips, and beetroot; Lower Styria and Carniola, maize, beans, grains, potatoes, and millet.

The following table (from the Blue Book on the Land Revenue) gives the average yield in metzen to the acres (1 metze=1·6918 bushels)—

—	Wheat.	Rye.	Barley.	Oats.	Potatoes.
Styrian Highlands	12·20	12·20	10·25	18·40	120–150
Bohemia, Moravia, Silesia	12·14	12·14	18·30	18·30	100–200
Upper Austria	16·22	18·25	20·28	25·35	—
Styrian Lowlands, Carinthia.	15·18	15·22	20	25	
Galicia	14	12½	13	12·19	

GALICIA.

The produce of Galicia in 1871 in Vienna metzen (1 V.M.= 1.6918 bushels)—

Wheat	3,426,209	metzen.
Rye	7,185,912	„
Barley	6,086,622	„
Oats	10,911,844	„
Millet	212,928	„
Maize	617,119	„
Beans	200,973	„
Peas	505,235	„
Potatoes	16,915,808	„
Beetroot	1,304,298	centner.

Galicia also contains—

Horned cattle	2,070,572
Sheep	966,763
Goats	35,842

Cattle.

The cattle, which is chiefly of the Podolian breed, has somewhat diminished of late years in consequence of the scarcity of food, which has affected the sheep in the same way. In former years a proprietor held 500 to 1,000 head, but now rarely more than from 200 to 600. A good number of fat stock, however, is sent to Vienna market, principally of Russian cattle, which are brought to Galicia in the autumn, and fed up during the winter on the refuse of the distilleries. During the cattle show held in connexion with the Exhibition, Galicia sent some splendid beasts from the celebrated Horodenka breed of Baron Romaszkaw, to the purity of which great attention has been paid for the last 50 years.

Bees.

A curious speciality of Galicia is bee-keeping, which is carried on in a very systematic manner, particularly in the neighbourhoods of Brody, Zolkiew, and Stanislau. In 1857, one Julian Lubieneski, a bee-master, founded a bee school, which gave such an impetus to bee-keeping, that it has become quite a national industry. There are computed to be 734,493 bee-hives in Galicia, so that it is no wonder to find honey extensively shown in the agricultural section. The most interesting exhibit of this class was by Michael Gierdwohn of Cracow, embracing the microscopic anatomy of bees, different kinds of bee-hives, and a collection of insects known to be hostile to bees. In the same way Sigismund Romer had one of insects that commit ravages on corn.

Industries

Apropos of Galician industries, I may mention that she possesses 18 steam flour mills (of which two are in Lemberg), five steam bakeries, of which Count Mier and Count Wodzecki each own one; three sugar factories, one of which is worked by Count Alfred Potocki; two chocolate factories, both in Lemberg, besides 276 breweries, and 581 Branntwein distilleries.

Group IV.

The Austrian displays in Group IV. were vast and irregular, and quite defied all attempts at description. I shall broadly classify them, and then describe a few special industries of Austrian food. In numerical proportion, the exhibits were as follows:—Vienna, as might be expected, was at the head of the list, and particularly with her collections of flours, meals, and confectioneries. The Tyrol was next, and very conspicuous in sausages and "salami," principally made at Trient. Then came Dalmatia with her preserved fish, cheese, sardines, and olive oil; Bohemia with a fair collection of flour and meal; Moravia with gherkins and sugars, in which also Galicia and Silesia were rich, and Coast Land with herbs, olive oil, fruits, oxtongues, and fish.

Austrian milling.

The great rise and progress of the Austrian milling trade is due to a considerable extent to the Empress Maria Theresa and her plan for colonizing Hungary with Germans. Up to the end of the 18th century the milling and provision trades generally were under very strict laws, the former being divided into two classes,—the trade millers (*Handels-müllerei*), who bought their grain wholesale in Vienna and Neustadt corn markets, and sold their flour again to the baking trade; and, secondly, a smaller class of mills (*Lohn-müllerei*) where anybody could get their flour ground on payment of so much per metze. Other names for these different classes of millers were baker's millers (*Backer-müllerei*), and groat millers (*Griessler-müllerei*), the former having their mills generally some distance from Vienna, such as on the banks of the Fischa, the Kalt Gange and the Swechat rivers, while the others were nearer town on the Wien, Liesing, and Mödling streams. This kind of location of trade prevails to this day, as do also the primitive watermills on the Danube, which may be counted by the score at a time by the tourist, travelling by steamer from Linz to Pesth. Milling, at the beginning of this century, was altogether a simple affair, consisting only of a water wheel and a bolting box. Everything else was done by hand, the object being merely to keep out the bran and get the flour as white as possible. No other refinement was thought of. The larger particles were sorted in a sieve, and the bran taken away with a hand shovel, which made it a very tedious operation. Even at that time, Vienna flour, such as it was, had a considerable reputation, and in 1810 there was a large trade in it under the name of "Wiener Gries," between Vienna, Berlin, Trieste, and Venice. The demand for it increased so rapidly, that it set the millers thinking how they could improve their mills, and the result was, the placing the millstone higher, in other words, the inauguration of the high milling (*Hoch-müllerei*) system; and from that time Vienna milling made quick progress. The father of the trade may be said to have been Ignatius Power (died 1842), who had large mills at Voslau and Leobersdorf, and who succeeded in obtaining a very much finer kind of flour, which is called to this day, "Auszug." He also, in conjunction with another miller named Winter, introduced cleaning machines by means of a current of air. In 1814, corn from the Banat district was brought to Vienna, and produced such splendid flour, that it became in great request with the bakers. The next improvement was the cleaning of the corn (1820–30) by a duster (*stauber*), introduced by Mittermüller and Volk, followed by increased numbers of stones, greater motive power, and the use of cast iron in mill machinery. Invention had doubtless been stimulated by the offering of a reward of 200 ducats by the Government for improvements in milling work. It was, however, in 1830, that the great impetus was given to the trade by the realisation of the Empress' idea, and the cultivation of the extensive plains and arable lands of Hungary. An enormous quantity of corn was brought into Vienna; forwarding houses were established, and there was a constant succession of carrier trains on the road from the Banat. Hungary became all at once the granary of Austria, and Pesth began to be known as a great centre of the corn trade, and made steady progress towards the important position that she holds at the present day. Vienna milling became a household word, and throughout Germany and Switzerland was considered the best system in existence. A good deal of difficulty occasionally rose from the scarcity of water, and particularly in 1834, when there was a great drought; but it was not till 1842 that we first hear of a steam mill in Austria. The increase of the trade may be shown by the fact, that the mill-building firms of D. Specker, and Exter, Wys, and Co. have within the last 23 years put up 742 sets of stones and 138 "Walzen-stullung" (cylinder rollers), a plant sufficient to mill 44,000 centners of flour in a day. Austrian milling may with truth be called not only a national but a European trade.

Baking trade.

The bakers of Vienna, and indeed of the whole country, were subjected to very harsh laws, and were under the most strict supervision by the magistrates and heads of guilds. No matter what was the price of corn in the market, bread had to be supplied to the public at a fixed price, without any power on the part of the baker to alter his tariff. The miller was not obliged to deliver his flour if the price did not suit him, but the baker must deliver his bread under all circumstances, and if he failed or declined to do so, he was treated like a criminal. The Emperor Joseph, during his short reign, removed a good many of these hardships, and in the year 1809, the compulsory price of bread was abolished altogether. The great improvements in the mills soon had their effect on the baking trade, and Vienna speedily took a high place not only for ordinary bread, but for fancy baking (*luxus-gebäcke*). This reputation is worthily maintained, and it may safely be said that for lightness and flavour, few breads in the world excel those of Vienna.

Pastry.

The pastrycooks were in great force at the Exhibition, and sent cakes, tarts, and sweetmeats in wonderful profusion, together with magnificent sugar work which even the Parisian confectioners could not beat. Gerstner, of Vienna, was conspicuous for this class of exhibits, which included the story of Little Red Riding Hood in sugar.

Wiener Backerei.

The specialities of Vienna baking were exceedingly well exemplified in a handsome building called the "*Wiener Backerei*," established by Herr Roman Uhl, as a kind of restaurant, where cold viands, coffee, ices, and everything in the shape of bread and biscuit could be obtained, the latter being baked daily on the premises, which were most complete, and possessed all the latest contrivances.

Bread.

Although large household loaves are to be obtained at the bakers, they do not form the ordinary breads that are set before the visitor in the higher class of cafés and restaurants, while in the lower grade of eating houses, black bread is almost invariably used. The ordinary bread for breakfast and dinner is the "simmel," a little round, rather hard crusted roll, with the four flaps of the crust meeting in the centre of the upper surface. The price of these, as well as all other kinds of roll in Vienna, is fixed by law at 2 kreuzers (about ½*d.* a piece), and it was fortunate that, during the unusual and tremendous rise in provisions that took place during the Exhibition, the price of bread could not be altered at will. The breads generally met with at the cafés (for a basket of bread is always brought with the coffee) are sweeter and more of the fancy kind. They consist of the "kipfel," a semilunar roll, tapering off at the ends, and something like, only smaller than, our milk rolls. The "brezel" is oblong and tapering, with wavy diagonal lines on the upper side; the "salztange," longer and thinner than the last and with a plain surface, and the "pounzel" like a small plain bun, with a single cross cut upon it. I witnessed the baking process at the Wiener Backerei. The mass of dough was divided simultaneously by a machine into 32 pieces, each of which is worked up by hand, and the peculiar crust-mark of the simmel is not made with the knife but with the fingers. In the case of the kipfel a flat piece of dough is rolled out very thin, and then rolled up with great dexterity, and twisted into the crescent form, which, by the way, commemorates the siege of Vienna by the Turks. A baker's boy heard the noise of the besiegers' mining operations under the city, and in reward for giving the timely notice, his master was granted a monopoly of selling half-moon kipfels. In all these kinds of bread, ox lard, butter, and milk, are added to the dough, the kipfel requiring more milk than the other. Some of these rolls, both out and inside are plentifully sprinkled with carraway seeds. Buns, or anything in the shape of currant loaf, is unknown on the pastrycook's counters, and as a rule, biscuits (except English ones) are rarely or ever seen, the term "bisquit" in Vienna being applied to sponge cakes. On the other hand the variety of fancy cakes and macaroons is enormous, the chief favourites being chocolate marrons (price 5 kr.), "Mandel Kolatchen" (almond knobs), and almond rings. "Patienz Gebacken" (patience pastry) is the nearest approach to biscuits, being very hard, and as the name implies, not easy of immediate disposal.

Leb-kuchen.

"Leb-kuchen" (gingerbread) is another favourite article of pastry, although in this particular dainty Nuremburg (Bavaria) carries off the palm from every other town. Although called gingerbread, it contains no ginger, but is a mixture of flour, sifted sugar, almonds, eggs, candied orange, citron peel, cinnamon, cloves, and carbonate of soda. The great objection to this toothsome sweetmeat is, that it is far too rich to be wholesome, although this is a recommendation rather than otherwise to the Viennese, who are a confectionery-loving race. I consider, indeed, that this fondness for sweet things may account partly for the pallid cheeks, which are so characteristic of the young. For the matter of that, all Germans, as well as Austrians, appear to show in their countenances the effects of a style of cookery and diet, which is certainly not wholesome according to our English ideas, although it is counteracted to a great extent by the healthy habit of early rising, which prevails amongst all classes, high and low.

Dried provisions.
Salami.

In preserved provisions there was not much show, though there was an immense quantity of the famous Hungarian pork sausage or "salami," as big as a man's arm, which is very largely consumed throughout the empire. It is a great favourite with the poorer classes, who not only eat it at home, but take it to the beershops with them. Indeed, in the smaller suburban public houses and gardens, it is the only solid food, besides bread and cheese, to be got, and is generally purveyed by a provision pedlar, who carries Emmenthaler cheese and salami with him, together with an enormous pair of scales. Most of the salami exhibits here come from the Tyrol.

Olive oil.

Trieste exhibited a profusion of pretty looking cakes and sweetmeats, together with pots of some sweet preserves called "scherbet." Dalmatia sent preserved fish, sardines, and olive oil, which is largely produced in the neighbourhood of Ragusa. It enters into the daily diet of the labourers in this district, their supper consisting of cabbage and oil with bread, the retail price of the oil being about 6*d.* per pint.

Beetroot sugar.

The show of beetroot sugar from all parts of the Austrian empire was magnificent, and quite bewildering in its extent. The following table gives some interesting statistics as to the gradual increase of the beetroot cultivation :—

				Centners of beetroot.
In 1835	were	17	factories using	374,080.
1840	„	41	„	1,382,080.

				Centners of beetroot.
In 1845	were	48	factories using	1,747,200
1850	„	84	„	1,958,746
1855	„	109	„	7,245,440
1860	„	131	„	15,899,353
1865	„	141	„	18,362,167
1870	„	181	„	24,507,840
1871	„	220	„	35,280,000
1872	„	251	„	31,360,000

Equally suggestive is the proportionate decrease in the importation of colonial sugar with the increase in the exportation of beet sugar.

——	Colonial imported.	Beet exported.
	Centners.	Centners.
1835 - -	540,772	34
1840 - -	536,761	311
1845 - -	601,171	39
1850 - -	677,866	229
1855 - -	839,766	327
1860 - -	42,230	17,038
1865 - -	3,447	389,658
1870 - -	2,080	967,809
1871 - -	283	1,689,171
1872 - -	200	1,303,138

The following is the present number of factories throughout the dominion. Styria, 1; Galicia, 5; Lower Austria, 6; Silesia, 10; Moravia, 50; Bohemia, 158; Hungary, 32, making a total of 262.

The same conditions which brought about the beetroot sugar cultivation in Germany operated here. The first Austrian beet factory was established at Datschitz, in Moravia, about 1829, but circumstances were against it, and it was used for refining colonial sugar. A second was established in the following year at Dobranwitz, in Bohemia, which was followed by several others. At the same time, through Dr. Limberger's exertions, about 20 factories were planted in Hungary, Galicia, Styria, and Kraim. Up to 1836, machinery was imported from France at great cost, but several firms in Troppau, Prague, and Vienna began to make the plant for themselves. All the latest improvements of modern factories are now to be found in Austria; and the result was shown in the excellent quality of the sugar exhibited in 1873. Many of the factories are on a large scale, and use up the whole beet produce of an extensive district; to prevent the loss of work after the roots are brought in for the season, they are dried in kilns, and thus preserved for use at any future time. In one establishment in Galicia there are 14 of these kilns, costing from 500*l.* to 600*l.* each, erected within a circle of seven leagues from the central factory, the object of their distribution over so large an area being to reduce the cost of cartage, which upon a root containing 8-10ths of its weight in water, is very considerable.

Kaffee-surrogat.

" Kaffee-surrogat " is largely consumed in Austria, as in Germany, and is made out of chicory and beetroot. The chicory cultivation is extensive, and particularly in the districts of Schönfeld, Lobositz, and Laibach.

Salt.

The exhibition of salt products, too, was enormous in its extent. Salt is almost entirely a government monopoly, and is under the direction of the Finance Ministers in Vienna and Pesth (Ofen). The average annual revenue produced by it in the years 1870–71–72 was 16 million florins. There are upwards of 18 saline works in the empire (exclusive of Hungary), under the different forms of rock salt, salt springs, and the extraction of salt from lagoons. Besides these there are five private undertakings, which pay a tax on their yield in the shape of royalty. The following table shows the salt production in centners in 1871:—

———	Rock.	Brine.	Sea Salt.
Ebensee, Austria -	—	604,429	—
Ischl, " -	—	280,655	—
Hallstatt, " -	2,620	148,472	—
Aussee, Styria - -	2,575	262,992	—
Hallein, Salzburg -	526	330,043	—
Hall, Tyrol - -	—	286,465	—
Wielicza, Galicia -	1,279,036	—	—
Bochnia, " -	327,967	—	—
Lacko, " -	—	94,442	—
Stebnik " -	—	121,918	—
Drohobycz, " -	—	84,131	—
Bolechów, " -	—	114,992	—
Dolina, " -	—	85,889	—
Delatyn, " -	—	93,573	—
Lanczyn, " -	—	60,501	—
Kossów, " -	13,418	48,886	—
Kaczyka, Buckovina -	36,854	18,191	—
Stagno, Dalmatia -	—	—	32,821
Private Salt Works.			
Pirano and Capo d'Istria, Istria.	—	—	507,985
Pago and Arbe, Dalmatia.	—	—	115,307
	1,662,996	2,633,579	656,113

making a grand total of 4,952,688 centners. The Exhibition of appliances for salt mining, plans of works, maps of districts, was on a most complete scale, and there were also many interesting models, such as that of Wielicza mines in Galicia, the whole of which representing the interior, with shaft, galleries, tramways, and workmen were entirely made of the rock salt itself.

Fruit.

Austria was ever a great fruit country; but this speciality has very much declined of late years. The numbers and kinds of fruits to be found in the Vienna market have been steadily decreasing, and several well known pears have altogether disappeared, such as the Kaiser Francis (a celebrated winter pear), the Empress Caroline Augusta, and the Archduke Anton. These are never seen now, and what is worse, have not been replaced by any other good sorts. At least 30 kinds of apples and 50 of pears have dropped out of memory in this way. As might be expected, really good fruit is exceedingly scarce and dear, and no systematic attempts appear to be made towards replenishing this important article of food. Even the names of fruits which were once familiar to horticulturists have died out. This may be attributed in some degree to the increased consumption of beer and tobacco, and the dread of the cholera. On the other hand, Bohemia and Moravia are celebrated for the cultivation of their fruit trees. Very great care is bestowed upon them by the owners of property, and the consequence is, that not only the gardens, but the fields also abound with excellent trees. The banks of the Elbe, as far as Aussig, are celebrated for fruit, and export to the north of Germany the Borsdorfer apple in large quantities. The little red "jung-fern" apple is also sent to Dresden, Berlin, and St. Petersburg, for the purpose of dressing Christmas trees. In the Tyrol, Botzen possesses a complete system of fruit tree husbandry, and has a very large and important fruit market. In 1870, there were exported from thence 3,005,842 kilos. of fruit valued at 450,500 florins, while the fruit trade of Bohemia brings in a revenue of one million florins. Hungary too carries on a large trade in dried fruits.

HUNGARY.

Flour.

The cereal and flour exhibits of Hungary were such as became one of the most important agricultural countries in the world. Fine flour is the great speciality of Hungary, which exports it largely to Austria, Egypt, North Germany, and England. In 1872, 72,466,000 lbs. were sent to the latter country *viâ* Trieste, and 20,000,000 lbs. to the East. In 1868 Pesth received 1,3625,000 pecks of wheat, and exported 11,235,000 pecks of flour; but a succession of bad harvests and some terrible inundations of the Banat district have of late years much diminished the yield, which in 1872 was only 9,323,000 pecks of wheat received and 1,110,000 of flour exported. The average price of wheat at Pesth and the 200 weekly corn markets which Hungary possesses, is

	Flo.	Kreuzers.
Wheat - - -	6	58 per peck.
Rye - - -	3	76 ,,
Oats - - -	1	71 ,,

Flour 16 fl. to 28 fl. 95 kreuzers per bag of 200 lbs.

Some of the mills in Pesth, such as the Concordia are famous throughout Europe. They are nearly all worked by steam and possess from 20 to 120 pairs of stones. I may mention that the Hungarian agriculturists lose no opportunity of improving their wheat crops, and during the Exhibition the whole of the Australian wheat (especially the South Australian) was eagerly bought up for Hungarian planting.

Pigs. I have already alluded to the pork sausages and salami. Hungary has become not only a great supplier of corn, but also of bacon and lard to the whole of Europe; but in 1872 the crops failed so much that it was impossible to fatten the pigs. The average price per cwt. is 31 flor. 75 kreuzer. In Servia there is no trade so important as the pig trade, the number exported in 1870 being 368,313. Two thirds of these were fattened at Steinbruck near Pesth, a very large establishment where 500,000 pigs are fattened annually. The pigs run to fat very much, but are long in the leg. The following number were sent to Pesth in 1870 from—

Upper Hungary -	206,320
Transylvania - -	55,340
Servia - - -	235,160
	546,730 valued at 3,000,000*l.*

These were all melted down for fat, being useless for many purposes. Most of this fat or lard is used up in Austria, Vienna alone taking the fat from 248,540 pigs.

CROATIA.

Croatia and Slavonia do not often enter into the calculations of those who are interested in food resources, but they contribute a very respectable share nevertheless. About 88 per cent. of the land is productive, and there are 206 hectares for every 100 inhabitants, the soil generally being favourable to agriculture.

Cereals. In the spring, maize is largely cultivated, and in the autumn, wheat, barley, rape, and less frequently rye. The eastern portions of Croatia and Slavonia produce sufficient grain to export, but the military borders rarely yield enough to maintain its own population. In addition to the above-named, the land produces oats, spelt, millet, buckwheat, and sorghum. The wheat is of excellent quality, a hectolitre weighing from 72 to 78 kilos., and in Slavonia upwards of 80. A hectare of land will grow 42 hectolitres of maize and 40 of barley.

Fruit. The climate is also very favourable for fruit trees, which are planted not only in orchards, but scattered over the fields and along the roadsides. The plum is the principal fruit, from which they distil a kind of brandy called šljivovica, and make large quantities of sweetmeats. Prunes are largely grown, together with extensive forests of chestnuts, nuts, the sour apple (srcika), almonds, figs and olives. Mulberry trees are also planted to the extent of 77 hectares. The live stock of the country consists of

679,247 cattle, being 36 to every 100 people.
787,867 sheep, „ 41 „ „
750,491 pigs, „ 41 „ „

Both cattle and pigs have diminished of late years, owing to the prevalence of epidemics, which have caused great loss to the traders. The cattle in the western or mountainous portion of Croatia is a peculiarly small breed, while in Slavonia it is Hungarian and Podolian; the larger proprietors however use also Swiss and Tyrolese cattle. They are nearly all employed for domestic purposes and not for butcher's meat, which is nearly always mutton.

Industries. The industrial food statistics of Croatia and Slavonia are as follows: in Slavonia 14 steam flour mills, in Croatia 6, of which one at Fiume grinds annually 184,000 hectolitres, and employs 100 workmen. Water mills are common throughout the country. Biscuits are made at factories at Agram and Fiume, the latter annually using 390 tons of flour for export to Turkey. There is also a preserving factory, which turns out annually 240,000 boxes of preserved fruits, 20,000 of haricot beans, and 20,000 of fruit. Slavonia produces annually 28 tons of dried fruit, and 1,000 tons of "compôtes" of prunes, which are found on almost every dinner table in Germany.

Honey. At Segne there is a large honey refinery, from which 28 tons are sent out in the year. Like Galicia, Croatia and Slavonia are both honey countries, and send to market 1,680 tons annually.

RUSSIA.

Russia had 37 exhibits in Group II. and 85 in Group IV.

Cereals.

In the former class were autumn and spring rye, millet, spring wheat ("Ghirka"), autumn wheat ("Sandomirka"), oats, Scotch barley, mustard, field peas, some hard wheats called "koobanka" and "belatoorka," maize, Polish wheat, (*Triticum Polonicum*), English peas which had been cultivated for five years, lentils, and Australian wheat sown in 1868. Tver and Vladimir were the largest contributors to the cereal exhibits. The Russian wheats, and particularly those of certain districts in the south, resemble very much those of South Australia (page 12). There is also another resemblance, viz., that the average yield is very small. Russia produces less than half the crops of England or Saxony, or indeed less than any other European country, as the following table shows:

Belgium	yields	14	hectolitres of corn	for 1 hectare	of arable.
Saxony	„	13·2	„	„	„
Switzerland	„	9·3	„	„	„
Greece	„	6·1	„	„	„
Russia	„	6	„	„	„

"But if the present agricultural population was to bestow on their lands the care which the soil receives in other countries, the produce of corn would be double that now obtained; and while a sufficiency would remain for the population of 124 millions, would have five times as much for foreign export, the country now sends abroad about 6,500,000 quarters per annum." Rye is a very common article of growth. In the northern and central provinces, it is met with as far as lat. 51° 52', but beyond that line, it is only sown for local consumption. At Riga the average price in 1871 was 1*l.* 6*s.* 3*d.* per imperial quarter. Poland also exports rye largely; in 1870, to the value of 8,679,650 roubles (1 rouble = 3*s.* 1½*d.*). Wheat is grown in the whole of the south, and partly in the western provinces, and oats in the north and central zone. In Great Russia buckwheat holds an important position, and in South Russia, millet. Maize is grown mostly in Bessabaria, potatoes in the Baltic provinces, beetroot in Podolia and Kiev, where a beautiful sugar is made so close-grained and hard, that it is difficult to break it. The yield throughout the southern provinces, where it is principally sown, is 65 cwt. to the acre, and in 1864, 290,000 acres were allotted to it, exclusive of Poland. The exhibits of flour showed that Russia possesses plenty of manufacturing capabilities. The following mills were here represented:—

Mohilev, employing 30 workmen, and producing annually to the value of 250,000 roubles.

Rostov, employing 40 workmen and producing annually to the value of 350,000 roubles.

Novi Torjok, employing 100 workmen, and producing annually to the value of 1,200,000 roubles.

Kirsanow, employing — workmen, and producing annually to the value of 200,000 roubles.

Tchirkovo, employing 42 workmen, and producing annually to the value of 185,000 roubles.

Jitomir, employing 100 workmen, and producing annually to the valne of 1,000,000 roubles.

Vinnitsa, employing 130 workmen, and producing annually to the value of 200,000 roubles.

Sokhalchef, employing — workmen, and producing annually to the value of 150,000 roubles.

Lovitz, employing 30 workmen, and producing annually to the value of 300,000 roubles.

Sugars.

Of the sugar exhibits, 26 sugar factories and refineries were represented at Vienna, employing 20,000 workmen, and producing on an average 53,000,000 pouds (1 poud = 36·1056 lbs.) valued at 35,000,000 roubles. Some of these establishments were on a very large scale, such as the one owned by the Countess Potocki, and Prince Saugouschko, which embraces a refinery at Schepetovka (Kiev), and five sugar factories with four presses, one at Klembovo, with eight diffusion extractors, one at Krementchoug, with 16 extractors, besides eight presses at Schargorod. The total number of workmen is 2,000, and the annual turn out 350,000 pounds of raw sugar, valued at 1,925,000 roubles, and 200,000 pouds of refined sugar, valued at 1,500,000 roubles.

Preserved food.

In the matter of preserved food, one scarcely expected to find much in Russia, and I was rather surprised to meet with some good looking extracts of meat, preserved partridge, reindeer tongue, and sturgeon roe, shown by M. Kletchovsky of Pinega. I was unable to taste the extract, but the directions (given in very amusing English), classed it as equal to Liebig. There were also exhibited preserved soups called "borstch" or "stchi," a common article of diet, especially about Taganrog. It consists of cabbage, beetroot, and leeks, boiled with a piece of meat or lard. It is much used by labourers, together with "karsha," a preparation of boiled buckwheat or millet grits, with melted fat or hempseed oil. Amongst other preserved products were dried smelts from Lake Talat, caviare, herrings ("schemaia") and green sugar peas, dried when unripe.

Confectionery.

Most of the confectionery came from Moscow, which city sent also an interesting collection of shortcakes and gingerbread. One Moscow chocolate factory employs 150 men. Another, which employs 250, sent pâtés of fruit and chocolate called "pastilas." From Rostoff and Riga came samples from the chicory mills in those towns, which turn out 70,000 pouds annually, of the value of 140,000 roubles.

ROUMANIA.

The food exhibits of Roumania consisted of a not very extensive collection of maizes, macaronis, and vermicellis. In themselves, those were not of any particular interest, save as representing the resources of a country struggling towards civilisation, and which, as far as cereals go, plays an important part in feeding this country. Roumania, or more properly the Roumanian Principality, was formed by the union of Wallachia and Moldavia, with Bucharest as the capital, although more real business is transacted at Galatz, which is the principal centre of all the Danube trade. The exports are mainly cereals, which are brought down in bullock carts to Galatz or Braila, and there shipped. The ports on the Danube above Braila ship to Tchernavoda, whence the corn is sent by rail to Kustendjie. In 1871 the produce of Roumania was—

Cereals.

Wheat - -	1,386,990	imperial quarters.
Maize - -	1,384,473	„
Barley - -	598,816	„
Rye - -	280,474	„
Beans - -	4,749	„
Millet - -	44,284	„
Oats - -	3,390	„
Flour - -	97,585	cwt.

The crop of maize was a fair one, though that of 1870 was 2,216,215 imperial quarters. The exports from Galatz and the other Danube ports to Great Britain far exceed those of any other country, and on an average may be valued at 1,500,000*l.* per annum. The exports of grain in transit from Kustendjie in 1871 were 237,794 quarters, and for local consumption, 178,538.

GREECE.

The kingdom of Greece sent a so far complete collection of food and agricultural exhibits, as to make us regret that the internal economy of the country is not better regulated, so as to allow of proper attention being given to the soil. Greece usually spends an annual sum of 5,700,000*l.* in purchasing foreign grain for her own wants, which with due care might all be grown at home.

Cereals.

The exhibits of cereals are wheat (in considerable quantities), oats, barley, rye, maize, and pulse, from different localties, bearing the classical names of Megæra, Thebes, Chalcis, Locris, Phthiotis, Elis, Argos, Corinth, Naxos, Cythere, Nauplia, Zante, Corfu, &c., the latter island principally growing Indian corn. There were upwards of 130 samples, which sufficiently indicate the food producing resources available.

Honey.

Honey formed a rather considerable exhibit, there being 12 samples, of which some came from the far famed Hymettus. There is, however, a honey made at Rhodomela, in Eubæa, which has a higher reputation than even that of Hymettus, in consequence of its superior flavour and aroma.

Olives.

Butter and olive oil were also shown, the latter being articles of great importance in Grecian industries. It is calculated that there are 7,500,000 olive trees, occupying a district of about 700,000 stremata (nearly 4 st. go to 1 acre), the yearly yield of which is from 5,000,000 to 6,000,000 okes of oil (1 oke = 2¾ lbs.). From 250,000 to 600,000 okes are exported to Russia, Turkey, Austria, and England, but in a good harvest, as in 1862, the export is 1,200,000 okes. The number of olives gathered annually is from 100,000 to 150,000, and the price of the oil is from 1 to 1½ francs per oke. Altogether the cultivated lands in Greece are 1,920,000 acres, which is not more than ⅙ of the Hellenic kingdom. The crops on the continent and Eubæa are wheat, barley, oats, maize, sesamum, and beans. The chief food of the peasantry consists of "tile cake" (κεραμεδοϖιτα), made of barley, or Βοϐωτα, a bread made of maize, together with salt fish, and olives.

Currants.

The display of currants was very good, as might be expected from a speciality so peculiar to Greece. This, its principal product, extends over 220,000 stremata, from which the yearly yield is from 100,000 to 125,000 Venetian pfund (1 Ven. pfund = 2.2046 lbs.). The export is chiefly to England, Germany, and Austria, and the average price (according to quality), 120 to 220 francs per 1000 pfund. In Cephalonia, which is the principal currant growing district, the cultivation has very much increased, and is carried on with great care and all the latest appliances, such as that of sulphur treatment to prevent the spreading of the oidium. In 1870, 9,870 tons of Cephalonian currants were exported, and from the Morea, 2,558 tons. From the whole of Greece 49,000 tons were shipped for England in 1871; but the returns yielded by currants are very uncertain, no precautions being taken to prevent the rain from causing fermentation of the fruit while drying, and thus the crop is seriously damaged.

Fruit.

Greece also exhibited a few other fruits, such as figs, pistachio nuts (from Athens), walnuts, and hazel nuts, together with some limes from Chios, of an aromatic flavour, and about the size of a mandarin orange. In the Peloponnesus there is a bitter orange called Φρακονερανζο, which has a rough warty surface. Of manufactured foods, the exhibits were almost *nil*, consisting only of a few biscuits, and some chocolate from Athens, priced at 7 francs per oke.

TURKEY.

The food products of Turkey were not very extensive or varied. There was a fair show of wheat, some of them designated by special names, such as Cotchina, Cabachak, Gumuldjine, &c., which I imagine apply to the district in which they were grown. Millet was rather extensively exhibited, it being used under the name of "dari," for mixing with wheat flour, on account of its cheapness. From Koordistan was shown a very small red hard grain in a beardless ear, which is called Kirmizee Koseh (bald). The weight averages from 48¾ lbs. to 57½ lbs. per "gote," of which 16 make an "ismar" or 1¼ quarters.

Manna.

From Koordistan also was exhibited manna, called in Turkish, Kudret-hal-vassij, or the Divine sweetmeat. It is a natural production which is found in the early spring and late autumn, on the leaves of the dwarf oak and other trees. It is collected by being shaken off the tree into a cloth placed underneath, and is eaten both wild and made into paste to be added to sweetmeats. When clean it is taken to market, and fetches about 2*d.* or 2½*d.* for 5 lbs. There was also a root, which, I believe, was the "Shereesh," the young shoots of which are cooked and eaten, while the root itself is made into glue. Amongst the fruits were olives, largely exported, together with oranges and lemons from Smyrna. The fruit, however, is knocked off the trees with sticks, and the oil is thereby much wasted and deteriorated. The "kalouba" or locust bean is grown in Cyprus, and exported thence to the Black Sea ports. Salt also came from Syria and Cyprus. In the latter island are the salt lakes of Larnaca, which 30 years ago were leased for only 400*l.* per annum, but now produce a revenue of 20,000*l.* Damascus sent dried apricots, for which that district is famous; indeed, when fresh, they form a principal food of the people for about two months in the year.

Seeds.

Several seeds of fruits were sent, such as those of the melon, and others with which I was unacquainted. "Kenguel" is one of these, used roasted and ground like coffee, for which it is sometimes substituted. It is the seed of a plant called "gumelia."

BOSNIA.

Plums.

Amongst the fruits, I ought to mention the plums from Bosnia, which are of so much importance to the peasant. Indeed, he is almost entirely dependent on the crop for his livelihood, and a bad season is ruin to him, for he usually mortgages the crop to the moneylender before it has come to maturity. The price of plums in 1871 was 160 piastres (1*l.* 4*s.* 8*d.*) to 240 (1*l.* 17*s.* 0*d.*) per 100 okes (281 lbs.).

EGYPT.

Egypt exhibited a small but well selected collection, principally of maize, wheat, millet, rice, sorghum, dates, potatoes, sugar, dried fish, bananas, and tomatoes, which latter are a common eatable in Alexandria.

Flour.

It is a singular fact that Egyptian wheat is dearer in some parts of Egypt, Suez for instance, than it is in London; and as the flour is not the best for fine bread, that generally used is Hungarian, imported from Pesth in barrels of 290 lbs. Millets, called "petits mais," are largely grown; indeed at one time Egypt grew more millet than corn. The cultivation of sugar is very fast increasing, and the Khedive has erected several factories with all the latest improvements for preserving, desiccating, crystallising, and refining. The land devoted to the sugar cane is now about 100,000 "feddams" (1 feddam is a little less than an acre), but the loaf sugar is not so white as that refined in England or France, though it is said to be sweeter. Of the rice, that which is grown at Rosetta, and generally in the Delta of the Nile, is considered to be the best. Dates were plentiful, and of several varieties, including the Dongolah date and the Hamry de Beilbeis, which form the dry dates which come to England. There was also the fruit of the doom palm (*Hyphene Thebaica*), which is eaten under the name of Alexandrian gingerbread.

Fish.

The dried fish was sent, I presume, as specimens of what are caught in the Red Sea. A flat fish, said to be good, is called "Moorgam." It is, perhaps, worth the attention of philologists that there is a fish in Cornwall used for making soup, which the natives call "morghi."

TUNIS.

Cereals.

An interesting contribution to the Exhibition came from Tunis, in the shape of corn, maize, barley, haricot beans, chickpea, beetroot, coriander, radish, mustard, cumin, aniseed, fennel, lentils, pulse and pepper. Tunis is very productive in wheat and barley, especially in the neighbourhood of Baggia and the hilly districts round Tuburbar and Matar. During the summer the people prepare their winter stocks of bruised corn, called "burghel." Bruised barley too is much eaten, under the name of "Maltut." The bread in general use is mixed wheat and barley, made up with "Wittura," or small bits of olive skins after the oil is extracted. Travellers on long journeys use "Besisa," a very fine flour made of barley, and mixed with "Dro," or millet soaked in water.

Fruits.

Of fruits there were exhibited pistachio nuts, figs, raisins, olives (black and green), dates, melons, oranges, bananas, &c. Susa and Monastir are the best olive districts in Tunis, there being at the former place upwards of 4,000,000 trees; and if the cultivation was more energetically attended to, double the crops could easily be produced. The olives are gathered in December and January, the pickers using leather coverings to the fingers. There are two kinds of oil, the "masri," strong in flavour and smell, and the "drup-el-ma," which is deprived of both by being passed through water.

Fish.

A great deal of fish is used in Tunis, it being very plentiful in the lakes of Biserta, which communicate with the sea. But it is heavily taxed, one fourth of all that is caught (exclusive of all the roes) being retained by the Government. The roe of the grey mullet called "buttargho" is in great request all over the Mediterranean, 70,000 pairs per annum, being collected, and sent over to Italy, where they fetch 10*d.* to 1*s.* 8*d.* per pair. Prawns, too, are of great size, six to seven inches long. Tunis, the ancient Carthage, was always celebrated for them, and the Roman Emperors used to send for them for their banquets. Tunny fish preserved in oil (scabeccio) is much used. In the season from 10,000 to 14,000 tunny are caught in the Sidi Daod fishery, and the oil extracted from the head, backbones and refuse, by being placed in a large cauldron capable of holding 800 heads and 400 skeletons, which are allowed to boil for 24 hours. The price of scabeccio is about 6*l.* 10*s.* the 100 kilos., and the produce of the fishing in 1871 was--

Scabeccio preserved in barrels—value -	£10,336
Salted tunny - - - -	10,200
Scabeccio in tin cans - - -	7,200
Tunny oil - - - -	1,600

Polypus.

Another curious fishing in Tunis is that of the polypus or octopus, which is exported to the Levant and the Greek market during Lent, there being no prohibition against them in the orthodox church. In a good year, about 6,200 cwt. are obtained, and fetch from 6*d.* to 1*s.* 3*d.* a pair. Prepared octopuses are higher in price, as they have to be macerated by beating them on a slab, salted and dried. Their capture is effected in deep water by stringing earthen jars together and lowering them to the bottom. The fish, being inquisitive, immediately get inside, and sometimes from eight to ten polypi are found in the interior of each jar. In Group IV., Tunis had very little to show but confectionery, some little cakes called "gimblettes," preserved soups named "Mehamasa," and "borghal," together with couscousou, this last being a preparation of the semoule of hard wheat (page 207).

PERSIA.

The Persian exhibits consisted of almonds of various kinds, raisins, jujubes, barberries, apricots, plums, olives and preserved sugar cane. Persia does not do much towards contributing towards the food supply of other nations; her chief exports being pulse, beans, butter, cheese, raisins, treacle, curds, melon seeds, pistachio nuts, dates, rice, dried shrimps (from Bushire), pumpkin and cucumber seeds and pomegranate juice.

CHINA.

China had a fair show of wheats, barley, maize, and rice of different kinds from the various provinces, with potatoes, beet, beans, millet, &c.; but her great strength lay in her teas and preserved provisions.

Teas. It is almost superfluous to mention that the two teas, black and green, grow on the same plant and are only modifications of each other, arising partly from climate, but chiefly from manipulation. The provinces in which the cultivation is carried on most extensively are on the south-east coast, such as Fo-Kien, Kuantung, and Tschekiang, also in the south inland provinces of Hu-pe and Kiangsi. From hence came the greater part of the samples of Congou, Souchong, Oolong, Pekoe, Pouchong, Young Hyson, and Twankay, that are so dear to English tea-drinkers, although of several of these only the chests were shown. Some few samples also came from the Island of Formosa.

Brick tea. The best black came from Fut-schien and Amoy in Fo-Kien, while Hankeu and the province of Hu-pe sent tea dust, and the celebrated brick tea which is so largely manufactured in the shape of tiles for the nomadic tribes of Central Asia. It is made in the three forms of large green, small green, and black brick, the two former of the leaves and twigs of the *Thea viridis*, and the latter of the siftings and dust from the Moning and Kaisow teas. Steam is used to moisten the mass, which is then compressed in wooden moulds, and when dry wrapped up in paper. The Mogul buyer tries them with a curious test, viz., by placing the brick upon his head and trying to break or bend it. If he fails to do this, the tea is sound. The average prices are as follows:—

Large green -	4 taels	per basket of	36	bricks.
Small green -	4	,,	64	,,
Small black -	4½ to 5	,,	64	,,

(1 tael = 6*s.* 8*d.*)

The brick tea trade, however, has undergone great changes of late years, for the Russians have settled in Kiatcha and taken a great part of it away from the Chinese. The annual sales in Mongolia are upwards of 50,000 baskets per annum. It is used by rubbing the brick to powder, boiling with steppe water, adding salt and fat, and then decanting the mixture. From 20 to 40 cups a day are drunk, with the addition of milk, butter, and roasted meal. From Canton came a suggestive collection of the colouring matters used for facing tea; viz., the "chunam" or native lime, and Prussian blue, although the latter is now generally discarded for indigo and turmeric. It would have been well if some samples of "lie" tea had also been sent, though it was scarcely to be expected that the tea growers would criminate themselves so far.

Dried food.

The dried and preserved provisions contained some curious things, such as candied arbutus fruit, chestnuts, sliced lotus root, earthnuts, oranges, peas, and plums, together with eggs preserved after the following fashion. They are covered with a paste of quicklime, tea, sea salt, and oak ashes, and then packed away for three months in boxes, separated from each other by rice. As a matter of taste, they are not nice, the white being coagulated and the yolks having turned green, while the smell is anything but pleasant.

Eggs.

Sea-slug

The "Bêche de Mer," or sea slug, (*Holothuria edulis*) is another luxury, and an ingredient in the gelatinous soups. There is a great trade in this article of diet between China and the South Sea Islands, the price ranging from $10 to $60 per picul, according to quality. The polypus or octopus, exported from Tunis (p. 245) together with sharks' fins and maws and edible bird's nests (*see* India, p. 199), were all exhibited here, and gave the visitor a good idea of the gourmanderie of China, though but a faint one of the extraordinary economising of every kind of food, animal and vegetable, that goes on throughout the whole empire, and which might be imitated by western nations with happy results.

JAPAN.

Japan, the most European of Oriental nations, exhibited a miscellaneous but most admirably preserved collection in Group IV., consisting of rice and wheat flour, soy-bean flour, mustard and potato flour, rice bread, macaroni, sugar, chestnuts, dried apricots, fish, caviare, fruits and preserves, together with a few samples of Japanese tea, which as far as quality goes, is a formidable rival to that of the Chinese.

LIEUT. T. H. ANSTEY, R.E.

INTERNATIONAL HORSE AND CATTLE SHOWS.

REPORT on the INTERNATIONAL HORSE and CATTLE SHOWS held in connexion with the Vienna International Exhibition of 1873.—By LIEUTENANT T. H. ANSTEY, R.E., Official Delegate to the International Jury.

THE INTERNATIONAL HORSE SHOW.

Opening the show.

The ceremony of opening the International Horse Show was performed by His Majesty the Emperor in presence of the King of Italy on the 18th of September. The demands of agriculture, the enormous development of modern armaments, the increase of wealth and consequent demand for all that class called by the French *chevaux de luxe*, have made horse breeding a matter of the greatest moment, and the masses who frequented the Exhibition from the 18th to the 27th September, showed clearly how keen an interest was felt for it by all classes of society. As a show, it was undoubtedly a success unalloyed by any blunder, accident, or case of illness, and too much credit cannot be given to his Excellency Count Grünne, the Emperor's Master of the Horse, for having chosen so well the numerous distinguished subordinates who carried out the details of the magnificently conceived design. All and sundry united in considering the 10 days during which the show lasted, to have been the best during the whole of the International Exhibition, while the weather was throughout magnificent, and the attendance as brilliant as it was numerous. The stables were built on three sides of a square, and stalls being next the walls throughout, while in the centre was a double row of loose boxes with sufficient space between them to serve as commodious dwellings for the grooms, serving the purpose at the same time of harness-rooms. Not only was the greatest care and attention shown in the arrangements for housing the 445 horses, but the attendants were equally well cared for, and at a refreshment house erected in rear of the stables, an excellent dinner was obtainable for the moderate sum of 30 kreutzers or about seven-pence sterling, while the special entrance fee of 50 krs. formerly charged at the cattle show, which kept away many who would have otherwise visited it, was abolished, and all who paid their entrance money at the turnstile of the Exhibition building had free access to the horse show, and *vice versâ*.

Stabling, &c.

REGULATIONS.

The special regulations were as follows:—

1. The feeding of the horses must take place with a regard to the visiting hours of the public, which last from 11 o'clock in the morning till half-past 4 in the afternoon.

2. Forage.—Oats, barley, hay, straw, bran, of the best quality at cost prices, is supplied by the general direction of the Exhibition once daily from 5 to 7 o'clock.

Forage paid for by the zoll pound.

Exhibitors are free to pay for forage for the whole duration of the show, in advance or daily, according to what they receive.

3. The horses are groomed from 7 to 11 o'clock in the morning. By 11 o'clock the horses must be all ready groomed, the stalls, stables, and passages thoroughly cleaned and put into order, and the attendants properly dressed.

4. Those horses that are stabled elsewhere for the night, can be led off at 5 o'clock in the afternoon, but must be in their place in the show again at 10 o'clock every morning.

5. Stable kit and harness must be kept in the places designed for this purpose in the immediate vicinity of the respective horse-stalls, and must not hang in the stalls.

6. For the daily leading-out of the horses, two hippodromes will be arranged. Exhibitors have to provide saddlery, harness, and carriages, as well as coachmen and grooms.

7. All loose boxes and stalls receive from the general direction a distinctly legible number, which is dealt out to all alike. The same number stamped in tin is to be fastened to the halter, and the horses are not to be led out without this number. Exhibitors are at liberty to have tin or wooden plates made at their own expense, bearing the name and lineage of the horses, and to hang them up above them, but they must be of equal size, *i.e.*, 60 centimetres long by 40 high (23″ and 15″ Viennese measure).

8. The exercising of the horses can only occur after the morning feed or after 5 o'clock p.m.

9. All the horses are to be examined on their arrival and before they are located, and afterwards daily by the veterinary surgeons appointed by the Exhibition.

Sick horses can after inspection be taken to the sick horse stable. But doubtful horses are to be entirely removed.

The treatment of sick horses can be undertaken at the expense of the exhibitors if they so wish it. But the exhibitor is free to do as he likes.

10. The greatest care will be taken of the horses exhibited, but the General Direction takes upon itself no responsibility for possible injuries and other casualties.

11. In the immediate neighbourhood of the horse-show inns will be established in which suitable accommodation for the officials and attendants will be procurable at fixed prices.

12. Sick officials will be removed to a hospital on the advice of the inspecting physician of the Exhibition, if the exhibitor do not dispose of him otherwise.

Troublesome servants or such as will not conform to the established regulations, will be removed by order of the committee.

Sick servants will be replaced by trustworthy servants of the Exhibition until the exhibitors have procured another staff of attendants.

13. Smoking is forbidden in the horse-stalls, as well as in all parts of the show.

14. Complaints are to be made either verbally in the office of the horse show, or to be inserted in the complaint book there.

The member of committee actually present decides on the lesser complaints; the greater are settled by the whole committee for the horse show in conjunction with the Director-General of the Exhibition.

The jury for judging the horses was constituted on the 17th under the presidency of Count Grünne.

INTERNATIONAL JURY.

President.

Seine Excellenz Herr Graf Carl Grünne, G. d. C., k. k. Oberstallmeister Sr. Majestät des Kaisers.

Members.

FOR FRANCE.

M. de Laire, Inspecteur des Haras, faisant fonctions d'Inspecteur General.

M. l'Hotte, Colonel, Commandant du 12. Regiment de Dragons.

M. de la Motte, Inspecteur Général des Haras.

M. de Laveaucoupet, Général de Division, Membre du Conseil Supérieur des Haras.

M. le Marquis de Mornay, Député a l'Assemblée Nationale, Membre du Conseil Supérieur des Haras, Président de la Société Hippique Française.

For Italy.

Cav. Nobili Carlo, Luogotenente Collonello die Cavalleria.

For the German Empire.

Herr Herz, königl. Commerzienrath, Berlin.

Herr Lüderitz, Generalmajor und Oberland-Stallmeister, Berlin.

Herr Rueff, Dr. A., Director des Thierarznei-Institutes in Stuttgart.

Herr Wäcker-Gotter v., kaiserl. deutscher General-Consul in Pest.

For Austria.

Herr Armbrecht, Dr. August, Professor am k. k. Militär-Thierarznei-Institut, Wien.

Herr Attems, Graf Anton, Präses der Landes-Pferdezucht-Commission für Niederösterreich, Wien.

Herr Bäuerle, Adolph, Gutsbesitzer, Wien.

Herr Bieschin, Ritter v. Anton, Generalmajor a. D., Nimburg, Böhmen.

Herr Breunner, Graf August, Wien.

Herr Capri, Baron Michael, Scherbouc bei Stadikfalva, Bukowina.

Herr Dzieduszycki, Graf Julius, Lemberg.

Herr Dzwonkowski, Eduard Ritter v., Tarnow, Galizien.

Herr Ecker, Baron Edgar, Mitglied der Landes-Pferdezucht-Commission in Graz.

Herr Kinsky, Graf Octavian, Excellenz, Wien.

Herr Kompast, Eduard, erster Hofthierarzt, Wien.

Herr Larisch-Mönnich, Graf Johann, Excellenz, Wien.

Herr Mengen, v. Ferdinand, Generalmajor und milit. Inspector für die k. k. Staats-Hengsten-dépôts, Wien.

Herr Müller, Dr. Franz, Professor am k. k. Thierarznei-Institut, Wien.

Herr Nádosy, v. Nádas Alexander, Generalmajor, Wien.

Herr Oeynhausen, Baron Christian, k. k. Oberst, Wien.

Herr Petrino, Baron Otto, Czernowitz, Bukowina.

Herr Pillwax, Dr. Johann, Professor am Thierarznei-Institute, Wien.

Herr Rohan, Prinz Louis, Lissa, Böhmen.

Herr Reuss, Prinz Heinrich IV., Ladendorf, Niederösterreich, Wien.

Herr Röll, Dr. Moritz Friedrich, k. k. Regierungsrath, Studiendirector des k. k. Militär-Thierarznei-Institutes, Wien.

Herr Schwarzl, Ernst, Major und Hengsten-Dépôt-Commandant, Graz, Steiermark.

Herr Sieminsky, Graf Wilhelm, Präses der Landes-Pferdezucht-Commission für Galizien, Kopeczynce, Galizien, Wien.

Herr Sternberg, Graf Jaroslav, Excellenz, Bad Wartenburg, Böhmen.

Herr Stockau, Graf Georg, Präses der Landes-Pferdezucht-Commission in Mähren, Wien.

Herr Thun, Graf Ernst, Präses der Landes-Pferdezucht-Commission in Salzburg, Lambach, Oberösterreich.

Herr Wachtler, Geiza Ritter v., Präses der Landes-Pferdezucht-Commission für Steiermark, Wien.

Herr Wolansky, von Erasmus, Czernochonce, Galizien.

Herr Zichy, Graf Heinrich, Excellenz, Wien.

Herr Almássy, Graf Georg.

Herr Fesztetich, Graf Paul.

Herr v. Jankovich, Joseph.

Herr v. Keglevich, Graf Adalbert.

Herr Simmonyi, Baron Ludwig.

Herr v. Tisza, Ladislaus.

Herr Tormay, Adalbert.

Herr Wennkheim, Baron Adalbert, Excellenz.

Herr Zichy, Graf Victor.

FOR RUSSIA.

Herr Campiony.

Herr Dochtouroff, General, Attaché Sr. Kaiserl. Hoheit des grossfürsten Nicolaus von Russland.

Herr Middendorf, wirklicher Staatsrath, Akademiker, Excellenz, Petersburg.

It was decided to have two principal categories, viz., breeding horses and working horses with the following sub-divisions:—*a.* thorough-breds of both English and Arab race; *b.* Norrisch horses and others of heavy draught; *c.* heavy and light farm horses; *d.* heavy and light stud horses; *e.* large carriage horses; *f.* light ditto; *g.* trotters; *h.* hunters; *i.* hacks; *k.* and ponies.

In order to facilitate their task they divided into four sections. The 1st section took half-breds; the 2nd, the

Norrisch and other heavy draught, the heavy and light stud horses and farm horses; the 3rd, heavy carriage horses, light ditto, trotters, and ponies; the 4th, thorough-breds, hunters, and hacks.

England. England was unrepresented directly, though Messrs. Cavaliero and Hetherington exhibited two Norfolks, one a half-bred stallion, which was sold to the government as a stud stallion, and the other a half-bred mare described as a weight carrier. Both had lately arrived from England.

France. France sent 31 stallions and four mares, all the property of M. De la Ville. They were all of them carriage horses, and were described as standing from 1·60 to 1·62 (about 16 hands) of a metre high, and though down in the catalogue as Normans yet had a good deal of English blood in them. They found general favour though some of them were of very inferior stamp. It is much to be regretted that neither thorough-breds nor the useful Percheron breed were represented.

Italy. Italy sent six stallions, three of them half-breds and adapted to breeding carriage horses, two were half-bred Aarbs of no particular merit, and one apparently an Arab. The heavier horses came from the provinces of Salerno, Ferrarese, and Ferrara, the lighter ones from Rome, Udine, and Reggio.

Germany. Following the catalogue, we come to Germany represented by over 30 animals and eight exhibitors. The Ministry of Agriculture in Berlin sent 12 from the government studs of Trakehnen, Friedrich Wilhelm, and the thorough-bred stud Graditz. Of the 6 Trakehnen there were three stallions and three mares, well shaped animals, with good action perhaps a little leggy, but worthy representatives of that famous stud.* The first on the list is *Vorwärts*, black stallion, 14 years old, by the through-bred horse *Sahama* out of half-bred mare *Vecordia* (by *Black Hambleton*). It may be interesting to some, as showing the method of breeding adopted, to trace the descent of the remainder.

Flügel, brown horse, four years old, by half-bred *Vorwärts* out of half-bred *Flasche*, by half-bred horse *Thunderclap* by thorough-bred *Mickle-Fell*.

Pless, black horse, three years old, by *Vorwärts* out of *Petze*, by half-bred *Inspector*, by half-bred *Ganges*, by thorough-bred *Burgsdorf*.

Caserne, chestnut mare, five years, by thorough-bred *Rustic* out of *Cascatella*, by half-bred *Thunderclap*, by thorough-bred *Mickle-Fell*.

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* See description of Trakehnen

Vestalin, black mare, four years, by half-bred *Inspector*, by half-bred *Ganges*, by thorough-bred *Burgsdorf* out of *Viola* by half-bred *Promoter*, by half-bred *Eurydamus*, by half-bred *Prætor*, by thorough-bred *Blackamoor*.

Emma, black mare, three years, by half-bred *Venerato* by half-bred *Dorimund*, by half-bred *Eurydamus*, by half-bred *Prætor*, by thorough-bred *Blackamoor*, out of *Emmerling*, by half-bred *Promoter* (as above) and *Dorimund* was out of *Vecordia*, who was by thorough-bred *Black Hambleton*. Therefore, *Emma* on the side of the sire is fifth in descent from the thorough-bred stock.

The two best looking were *Caserne*, with thorough-bred sire, and *Vestalin*, who is third in descent on the side of the sire, and fourth on the side of the dam from the thorough-breds. From the Friederich Wilhelm stud three animals were sent.

Lucca, black mare, six years, by *Torso* (by half-bred *Nobleman*, by half-bred *Ganges*, by thorough-bred *Burgsdorf*), out of half-bred *Leda*.

Birdbolt, grey horse, four years, by half-bred *Young Harlequin* (by thorough-bred *Harlequin*) out of *Billy* by half-bred *Saturn* by half-bred *Vorwärts*, by thorough-bred *Sahama*).

Vionville, brood mare, three years, by *Thanatos* (by half-bred *Reprobate* by half-bred *King of the Valley*), out of *Anisette* by *Torso* (as above).

It would seem high time to freshen the blood with thorough-bred. They were good looking animals, and though themselves of Trakehnen descent, were a shade shorter in the leg than the representatives of that stud. (*See Friederich Wilhelm* Stud.)

The Royal stud Graditz sent *Odoardo* black horse, four years, by the *Wizard*, out of half-bred *Ohra*.

Mazarin, chestnut horse, five years, by the *Wizard* out of half-bred *Marengo*. *Soll und Haben*, bay mare, by *Rustic* out of *Snowdrop*.

The two first half-breds are fine powerful animals, with excellent action, and the thorough-bred mare *Soll und Haben* is the picture of a racer, and is the best mare in Germany as far as her performances are concerned.

Mr. H. von Nitzschwitz of Königsfeld, near Rochlitz in Saxony, exhibited two very handsome Arab stallions, an eight, and a two-year old. The eight-year old was put up to auction and bought in at 1,000 florins (100*l*.). M. A. v. Reuss's dark chestnut gelding, said to be forty years old, excited some attention on that score only. Of the five horses shown by the brothers Schmidt of Hannover and Oldenburg, two were bought by the Austrian government for stud purposes. They were all of them good, strong, useful animals, bred in North Germany.

The next animals worthy of passing remark were the Arabs from the royal stud of Weil in Würtemberg. There were three stallions and two mares of unmixed race, and one specimen of a cross between an Anglo-Arab horse and pure Arab mare. The Arabs were good specimens of their breed, none of them up to 15 hands; and the cross, a bay handsome animal, was no bigger than his companions.

Austria. In the Austrian section the first Exhibitor is the Imperial Royal Ministry of Agriculture, Vienna, with 10 animals. Of these, eight were bred in the government stud of Radautz,* and two at that of Piber.

The stud of Piber, which I did not visit, is not far from Gratz in Styria. It was founded in the year 1798. Up till four years ago various breeds were represented, but now the Norman and Norfolk alone are cultivated.

Of those bred at Radautz we have—

Justice to Kisbér, bay, Anglo-Arab half-bred horse by thorough-bred *Justice to Kisbér* out of a *Samhan* half-bred mare of Radautz breed.

Wild Vine, bay, Anglo-Arab half-bred horse, by thorough-bred of the same name out of an *Elbedavy* half-bred mare.

Elbedavy XXII. 11, bay, half-bred Arab, by *Elbedavy XXII.*, out of a *Dahaby II.* mare of Arab breed.

Goldfinder I., light chestnut Anglo-Arab half-bred horse, by half-bred *Goldfinder I.* (Radautz breed) out of a *Troubadour* mare.

Manfred, black mare, English half-bred, by thorough-bred *Manfred* out of a half-bred *Blumfield* mare.

Seal, brown mare, half-bred, by the thorough-bred *Seal* out of a *Blumfield* mare.

Majestosa Erga, grey mare, by a Lippizza *Majestoso Erga* out of a *Samhan XII.* mare.

Tadmor, grey mare of Arab extraction by half-bred Arab *Tadmor*, out of a *Samhan XII.* mare.

From Piber were—

Majestoso XXXVIII., grey horse, pure Lipizza breed; and *Siglavy Alea*, grey horse, pure Lipizza breed.

All these were admirable animals, especially *Wild Vine*, *Elbedavy*, *Goldfinder*, *Siglavi Alea*, *Majestoso Erga*, and *Tadmor*. They were all remarkable for their sound, excellent legs, and generally beautiful proportions. Radautz is to the Austrian what Mezöhegyes is to the Hungarian officers. All are ambitions to be mounted on horses bred at one or the other of these studs.

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* See description of Radautz.

Of the seven animals next on the list, two are of Arab origin, and the remainder English breeds. Then follows a collective exhibition of the Carinthian Agricultural Society, Klagenfurt. There are but four participators, and they all show indifferent specimens of the excellent Norrisch country breed of draught horses.

The Viennese Agricultural Society show 20, and without being in any way remarkable there is some good stuff in some of them. Among them the names of the well known sires (*see* account of *studs*), *Buccaneer, Northstar, Furibso, Revolver, Nonnius, Wilsford,* &c. And the dams *Gidran, Furiosa, Elbedavy.*

The Collective Exhibition of the Society for Improving, &c. the breed of Horses in Gratz, consisted of 28 horses, and of these there were cart-horses of pure Norrisch breed, the so-called Feistritz-Raabthaler, Luttenberger, and Norrisch-oriental.

The Norrisch race was bred originally in Styria, and the Salzkammer Gut, though different valleys have given them their own names, as for instance the Pinzgauers, which are nothing more than horses of Norrisch breed. They are long in the body, and consequently rather hollow backed, with quarters hardly corresponding in size to the rest of the body, very round ribbed, and having plenty of bone, large crests, high withers, and long, comparatively lean, heads. It was the generally expressed opinion that as far as concerned the heavy draught horses, Austria need not go abroad to get thoroughly well suited. The Feistritz-Raabthaler and Luttenberger are not so heavy, and show traces of admixture of English blood. If the breeding be conducted with care it is thought that good carriage horses might be produced. A bay Luttenberger mare looked much more like a Nonnius than anything else.

The Norrisch-oriental were throughout bad, and it was generally hard to say what they were fit for. The Arab blood it is well known does not do in Styria.

The commission for lands in Salzburg sent eight good specimens of Norrisch horses. Next on the catalogue comes the most interesting exhibition of Arab blood in the whole show. One can hardly believe it possible—24 pure Arab brood mares! They are sent to the show by Count Julius Dzieduszycki, of Lemberg, in Galicia, and, as a foot note informs us in the catalogue, are descended from four Arab mares, *Sahra, Mlecha, Gazella,* and *Slepka,* brought from the desert in the year 1845. At the same time the stallions, *Azet, Bagdady,* and *Koheila* were brought. Besides these stallions many others have since been added. On their being trotted out one was struck with their wonderfully elastic action; they rather seemed to skip along than to trot. They were universally acknowledged to be of the highest class, though they would find greater appreciation in Arabia than in Europe. Indeed it is sad to think that almost the only use to which Arab blood is put in Austro-Hungary is in the production of light carriage horses. Crossed with the country horses of some parts of Eastern Hungary they turn out wonderfully active, enduring, and fast carriage horses, and crossed with the Lippizza breed they furnish those handsome and excellent greys to be seen in the imperial stables standing in teams of six, the one as like the other as two peas. The price demanded was 2,000 florins each for a lot of six, 3,000 each for two, and one alone 4,000 florins. Austrian critics, however, though never hazarding a doubt as to the purity of the breed, maintained that there was samething faulty in the manner of rearing them at their present abode. Experience has taught elsewhere that with proper food the progeny increase in size, while the lot were in almost every instance very weedy in appearance, and it was said by more than one that the foals did not get proper nourishment.

Count Nicholas Esterhazy followed with two English thorough-breds, six and three years old.

Next came eight English, shown by Prince Emil Fürstenburg, bred by himself, four of them, mares by *Conqueror;* and the thorough-bred brown horse *Cadet,* winner of the Austrian Derby of 1870, &c., by *Buccaneer,* out of *Dahlia,* by *Orlando,* bred at Kisbér. John Hetherington and Francis Cavaliero showed a bay Norfolk travelling stallion, which was bought by the Austrian Government, and a roan half-bred mare of Norfolk race. They both were much admired.

Edward von Jastrzebski, of Dembno, Post Brzesko, Galicia, shows five Arab stallions, the first, *Tahir,* put up at 4,080 florins, the remainder for sale, no price mentioned. The stud was formed in 1851–2, and riding horses are principally bred on the farm of Wola Dembinska on the estate whose name it bears.

The imperial stud of Kladrub sent 15 animals, of which one was an English thorough-bred mare, two were English half-breds, two black horses crossed from the thorough-bred *Northstar* and the Kladruber mares, *Abassa III.* and *Sacramosa;* four mules, three mares and a gelding, and the remaining were of the ancient Spanish race, bred at Kladrub (*see* Description of the stud Kladrub). The English mares are by *Lismore,* and are brood mares; the *Northstar* crosses were leggy animals, with, however, better heads than those of the race to which their dams belong. Of the mules, two were brown in colour, by the brown ass *Rinaldo*, out of black Kladrub mares, and two were white, by the white ass *Oberon*, out of white Kladrub mares.

Of the Kladrub mares, two were white and two black, and the stallions were both white.

The Kladrub family are distinguishable by the names which are used from one generation to another, like the Lippizza breed in that respect. *Alba, Ambra, Avara, Rigora, Sacramosa, Silvestra, Abassa,* &c. names for mares; and *Generalissimus Affabila, General Forata, Generalissimus Forbice, Sacramoso,* &c. for the horses.

The next striking lot were six travelling stallions of Norrisch breed from the Government depôt * in Upper Austria. Through the efforts made by Government, this breed, which was nearly extinct 20 years ago, is now in a most flourishing condition.† Count John Larisch-Mönnich, of Freystadt, in Silesia, showed six half-bred English horses, one of which was one of the finest animals in the show. He was four years old, by the thorough-bred *Richmond*, out of a well bred mare (*Welcome*). He stood 16½ hands, and took his fences very nicely. He was evidently up to great weight, and was a very handsome animal with the one exception that his head was not quite all that could be desired. All these horses were bred at Freystadt. Of Prince John Liechtenstein's four English horses, two of them, *Amazonia*, a chestnut stallion, four years old, by *Aprentes*, out of *Amazonia*, and *Manfred*, chestnut, seven years old, by *Daniel O'Rourke*, out of *Ambassadress*, were the most remarkable. The 10 horses sent from the imperial stud, Lippizza, showed the excellent qualities of the breed of the same name. Of the stallions four were pure Lippizzas, a *Pluto*, two *Majestosos*, and a *Conversano;* two were crossed with Arab blood, and there was one pure Arab, *Ben Azet;* the mares were three pure Lippizzas. They all had excellent action, and were well-shaped in all respects. (*See* Description of Imp. Stud, Lippizza.)

The new Vienna Omnibus Company showed a collection of ten animals of various breeds of the farm-horse class, Russians, Danes, and Hungarians, as specimens of the purchases they have made in different countries. Three curiously dappled horses shown by George Neumayr were bought to go to Italy. They were of the Pinzgau breed, and are adapted for harness. Of the lot shown by Baron v. Romaszkan of Horodenka, Galicia, four mares were by *Young John Bull* (half-bred by *John Bull*) out of Galicia mares improved with oriental blood. There was nothing of especial merit to note about them; two very nice ponies shown by the same attracted considerable attention, though one was evidently unsound. They were of the Huzul breed, bred in the mountains.

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* Stadl.

† One of them, a splendid piebald, was much admired by the King of Italy and was presented to His Majesty by the Emperor of Austria.

The well-known horse dealers James and John Schawel of Vienna, showed a very good lot. Those exhibited by the former were 14 English and Irish, chiefly hunters; two of them roans of Norfolk breed, magnificent animals, and a pony. Nearly all the hunters were described as being Irish, the sires being "*Plum Pudding*," "*Warlike*," "*M.D.*," "*Cheerful horn*," "*Knave of Hearts*," "*Confessor*," &c. Many of these animals will be completely thrown away in Austria. John Schawel's exhibit consisted of four hacks, two of them English, one Mecklenburger, and one bred in East Prussia; and a pair of very handsome sorrel Norfolk mares with black points. They were bought by the King of Italy, and excited great admiration. They were a lighter description of horse than any of the other so called Norfolks.

A very good lot of animals were those shown by O. M. Robert van Son, consisting of hunters, and two pretty ponies, 13 hands, a bay and a chestnut. Count Jaroslaw-Sternberg of Zasmuk, in Bohemia, exhibited three English hunters and a pretty two-year old Anglo-Arab mare. Count Ernest v. Thun of Söllheim in Salzburg, sent two two-year old cart-horses of Norrisch breed, and two yearlings by the Clydesdale horse Hamilton out of an English and Pinzgau mare respectively. Count Oswal Thun-Hohenstein's lot of seven, consisting of a half-bred English mare by *Chief Baron Nicholson*, and six others by an American thorough-bred called *Starke* were handsome useful animals; of the three shown by Count Leopold Thun, "*Beau Louis*," a thorough-bred chestnut gelding, four-year old by *Starke* out of *Indiana* was a picture for a park hack.

Hungary. In the Hungarian section Count Julius Andrassy was the first exhibitor with four thorough-breds, the first three were horses, three, two, and one year old respectively, all by *Jester* out of *Viola*, and the last a two-year old mare by Jester out of Fatima. The stud is at Tök-Terebes and consists of 155 horses of which 39 are brood mares, five stallions. Riding horses and carriage horses are chiefly bred. Count Alfred Andrassy came next with one white horse of Czyndery breed from his stud of Szigetvár. The Czyndery breed, which is chiefly to be met with in the province of Somogy, was introduced from Tartary about 150 years ago, and has been kept up ever since. The animals of this breed were in former times blacks and chestnuts, but have gradually lightened in colour with time, and they are now quite white. The breed is remarkable for speed, endurance, and docility. The stud consists of 30 brood mares and from 16 to 20 animals are sold yearly. The horse exhibited was about 15 hands, very good looking. The next exhibitor showed two stallions of Arab origin. The Ministry for Agriculture exhibited, from the Government studs, a total of 37 horses. All of them were chosen as types of the families bred in the different studs, and which are destined to improve the existing breeds in the country.

The Hungarian kingdom occupies a territory of 5,600 geographical square miles, and with a population of 15,417,327 souls, there are 2,158,464 horses, or 140 horses to every 1,000 inhabitants. The intention of Government is to endeavour, by supplying certain classes of stallions, to travel in those parts of the country where a corresponding class of horse though of inferior quality is reared, to establish at last fixed breeds from which sufficiently good stallions, may be obtained to keep up the breed without its deteriorating.

Up to the year 1868 the studs were under the War Ministry, but they have since been put under the Ministry of Agriculture, civilians being told off to the farms but the army furnishing the staff for the studs and depôts of stud stallions. These latter are:—

Depôts of travelling stallions *Stuhl-Weissenburg.*

I. The depôt at Stuhl-Weissenburg consisting of 570 travelling stallions. Of these on the occasion of my visit to the depôt, I saw 280, the remainder being at various out-stations Hochstrass, Bajna, and Ozora. From the stud Mezöhegyes there were a great many of the *Nonnius* breed (*see* Mezöhegyes), some *Schagyas* and *Furiosos* and a good many *Gidrans;* also a good many half-breds from the stud of Kisbér * and some few thorough-breds. I was told that the average number of mares served last year (1872) was 37½ per horse, at prices ranging from one to five florins, and the thorough-breds up to 10 florins. There were also a good many of Arab origin from Bábolna † and some were of the older Radautz breeds; *Elbedavy* and *Siglavi.* There were also some Lippizzaners. They were as a rule not quite as good specimens as were to be seen at the studs themselves, and the thorough-breds were poor examples. The best of the lot was a Lippizza horse; an excellent animal with splendid action. The depôt of Stuhl-Weissenburg extends its sphere of utility from the western border of the kingdom to the east bank of the Danube and its tributary the Eipel (Ipoly). It embraces 20 counties (comitat), and the horses scattered in 150 different places, served during the year 1873, 20,000 mares.

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* See account of stud of Kisbér.

† See account of stud of Bábolna.

Nagy-köröser.

II. Nagyköröser. Here there are 870 stallions kept at head-quarters and the various outposts Versetz, Eperies, Baga, Klein, Kis-Szent-Miklós and Âlmosd. It is spread over 30 counties extending from the Danube and Eipel on west to the Transylvanian border on the east, and the northern and southern frontiers of the kingdom, and served with 250 different standing places, 30,000 mares. In consequence of the great extent of the district another depôt will be established at Debreczin during the year 1874.

Szepsi-Szent-györgi.

III. Szepsi-Szent-györgi, with 280 horses and three outposts Homorod, Dées and Retteg, 8,000 mares were served during the year. The field of operations is Transylvania and the neighbouring counties Kraszna and Mittel Szolnok.

Warasdi.

IV. In Warasdi, where there are 122 horses and an outpost at Esseg, and scattered in 50 different stations, 5,000 country mares were served. The sphere of action of this depôt is over the whole of Croatia and Slavonia, which provinces support the depôt.

The state depôts were taken over by the Hungarian Government in 1869 and consisted, besides head-quarters and the outposts, of 392 stations and 1,331 horses. The numbers are now 525 and 1,800 respectively, and the number of mares served was in 1873, 63,000. Besides these efforts, farmers are encouraged to improve their breeds by prizes being given in 48 different places yearly, and besides diplomas of honour, 15,000 florins are expended therein. Races take place yearly at Pesth, Pressburg, Kaschau, Klausenburg, Arad, Debreczin, and latterly at Ödenburg. The state expends 5,700 ducats in prizes.

The first Government stud contributing, in the catalogue, is the celebrated Arab stud Bábolna near Nagy Igmánd (*see* Description of Bábolna).

The first on the list is a splendid chestnut horse *Mehemed Ali,* five years old, by *Mahmoud Mirza* out of a pure *Koreischan* mare. *Mahmoud Mirza* was born in the desert in 1851 and bought in England by Lieut.-Colonel de Butts in 1865. The dam was born in Bábolna in 1853. Her sire was an *Anaese* Arab born in 1837 and purchased for 1,200 florins in Syria, and brought to Austria in 1843 by Lieut.-Colonel Herbert.

Then a half-bred *Shagya* horse called *Merops* out of a *Merops* mare. *Shagya* was bought in 1836 by Lieut.-Colonel Herbert in Syria for 1,800 florins, and *Merops* came in 1855 from the Prussian stud Trakehnen.

Aghil Aga No. 11, chestnut, pure Arab mare, seven years old, by *Aghil Aga* out of *Gidran Elbedavy No.* 120; *Aghil Aga* was purchased from the Bedouin tribe Aneze Ruola of the breed Koheilan Adjuze. He was one of 14 which cost a total of 17,126 florins. The highest price given was 2,727 florins, and the lowest 605 florins. *Gidran-Elbedavy* was born in Bábolna in 1857, by *Gidran-Elbedavy* brought from Syria by Major v. Gottschligin, 1852. *Mahmoud Mirza*, bay Arab mare, fire-year old, by *Mahmoud Mirza* out of an *Aghil Aga* mare.

Tadmor No. 65, white, half-bred mare, by pure Arab *Tadmor*. *Tadmor* came from the Imperial stud Lippizza in 1857; *Hamad No.* 70, white, half-bred mare, 12 years, by *Hamad* (pure Arab), who was brought in 1857 by General Brudermann. The stud consists of about 500 horses of which about 60 are yearly sold (*see* Description of Bábolna).

From the Royal Free Town Debreczin, four animals are shown of Spanish race. The breeds forming the stud came originally, in 1822, from Count Philip Beleznay's Spanish horses, and Count Gyulay's Transylvanians, also of Spanish origin, and to improve the breed Franz v. Péchy's English horses, Count Almasy's Transylvanians and some stallions from the stud of Mezöhegyes. In 1866 fresh blood was introduced. There are at present 148 horses in the stud and from 20 to 25 head are sold yearly. Nothing noteworthy was to be met in the catalogue, till the lot of five from the Government stud Kisbér (*see* Description of stud), all were of English breed and the first on the list was—

Pride of England, No. 1, a four-year old brown Norfolk, about 15 hands 2 inches, of immense power, short-legged. with enormous girth and muscular development. He is by the imported Norfolk horse, *Pride of England*, out of a *Sutherland* mare.

No. 180, *Virgilius*, bay, half-bred brood mare, by *Virgilius* out of an Irish mare. She ought to throw excellent hunters if properly paired.

Justice to Kisbér, No. 49, bay, English half-bred mare, by thorough-bred *Justice to Kisbér* (by *Chief Justice*) out of a *Clinker* mare. An excessively elegantly shaped mare with magnificent action. She would be admirably adapted to make a light weight hunter.*

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* I had the pleasure of driving behind her when staying at Kisbér.—T. H. A.

No. 99, *Pride of England,* roan, Norfolk brood mare, 11 years old, about 15 hands 1 inch, by *Pride of England,* out of a half-bred Mecklenburg mare. A powerfully shaped animal, splendid stuff to breed from. Lastly—

No. 80, *Nordstern,* brown, Norfolk mare, nine years old, about 16 hands, by the imported Norfolk *Nordstern,* out of an Irish mare, *No.* 9 *Big Bess.* This stud has from 125 to 130 half-bred mares, besides thorough-breds, from which 25 to 35 horses in their fourth year are sent to the depôts as travelling stallions to serve country mares, and from 15 to 20 young mares are drafted into the stud for breeding purposes, and from 25 to 30 young horses or foals are sold by auction. (*See* description of stud.)

Next, we have the great half-bred stud of Mezöhegyes (*see* description), represented by 27 animals as types of the different families bred in the stud.

Commencing with *Pride of England,* a magnificent Norfolk nine-years-old, by a sire of same name, we find *Shagya, Furioso, Gidran, Nonnius, Majestoso, Abugress, Conversano, Merrylegs,* &c. The handsomest of these was *Gidran XXXI.*, 1, dark chestnut mare, by *Gidran XXXI.* out of No. 230 *Gidran XVI.*, and both *Majestoso XL.*, white horse, cross between the Lipizza, *Majestoso XXXIX.* and No. 424, *Shagya VI.*, and *Abugress VIII.*, bay horse by *Abugress VI.*, out of a *Gidran VI.*, *No.* 510, were very handsome animals. The Norman *Nonnius,* with their ugly heads, but good action excited great interest, and compared favourably with many of the Norman horses exhibited in the French section. Count Maurice Sándor, of Bajna, sent three thorough-breds and a half-bred of no particular merit; the highest price bid at the auction for *Bodkin,* three-year-old, by *Carneval,* out of *Bodkin,* was 80*l.*, and he was bought in. Count Joseph Stubenberg of Székelyhid showed two thorough-breds and two half-bred English; and Géza von Szüllö, a thorough-bred mare and half-bred gelding.

A very interesting family followed, shown by Count John Waldstein, consisting of *Gambia XI.*, black English mare, 25 years old, bred in Prince Eszterhazy's stud Ozora, by thorough-bred *Gambia,* out of a *Master Robert* mare, and the last six of her foals from *Denevér,* black English mare by *Cottswold* six-year old, to dark brown colt, one year old, by *Flying Cloud.* She has had something like 20 sons and daughters. Those exhibited here were a nice lot with strong family resemblance, though none of them were up to much weight. Count George and Aladár Zichy worthily bring up the rear with three well-bred chestnuts, two by *Revolver* out of *Formás* and *Dorothea,* and one by *Smaragd* out of *Dalilagerény.*

The 35 horses sent by Russia consisted of Orloff trotters Russia. and half-bred Arabs from the stud of His Imperial Highness Grand Duke Nicolai Nicolajewitsch at Tschesmenka, 16 in number, and the remainder from Goujon, Mazourine, Prince Odolensky in Tula, and Prince Sangusko. The latter's a charming exhibit of eight Arabs, all mares of pure race. These last were throughout larger than those shown by Count Julius Dzieduszycki, and certainly appeared to be plumper and better cared for than those of the latter. They almost all were as much as 15 hands, and perhaps one or two over that height. They were of all colours, two of them being cream-coloured, only one grey (flea-bitten), and the remainder dark bays; two had foals at their foot and all were beautiful animals, and excited the most lively interest. Prince Sangusko's stud is at Satanow in the Government of Podolia, 20 miles from the railway and frontier station, Woloczyska. The staff attached to it and the training stable is at Slawula on the Brody Kiew railway. The stud is throughout of pure Arab blood numbering 89 mares. To keep up the purity of the breed four expeditions went to Arabia, the first in 1799 lasting till 1803, the second from the year 1816 to 1818, the third from 1844 to 1845, the fourth in the years 1857–58, and there have been, moreover horses frequently sent direct from the East. A total of 60 stallions and seven mares have been thus brought. The stud has been in existence since the 17th century. The Orloff trotters are tolerably big useful animals, but they are not ornamental. The parent of the breed "*Bars*" was the result of a mixture of Arab, Dutch, and Danish blood; *Smetanska,* an Arab, was put to a Dutch mare, and the progeny, a stallion named *Polkan,* was put to a Danish mare, the result being the horse *Bars;* and from him has sprung the race of Orloff trotters.*

Egypt was represented by four pure Arabs, all of different races, shown by Sefer Pacha. The first on the list, *Emir*, a flea-bitten horse, nine years old, of the family Saglavy-Djedrani (*Gidran ?*), born in the desert near Bagdad, was the best. The others were *Zaaryf,* a chestnut horse of the Annase family, five years old, foaled near Damascus. *Nadir,* a grey of Nedjdi breed born near Bagdad, and *Ubegan,* iron grey, 3½ years old, of the family Saglavi-Suety foaled in Egypt. The jury awarded to these a medal of merit. In addition to these several more were shown, brought on speculation to Vienna by Arthur Bey.

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* "Zur Frage über die Reinheit der Race des Orloffschen Traber-Pferdes;" aus dem Russischen übersetzt von P. Jessen.

ROYAL PRUSSIAN STUD, "FRIEDRICH WILHELM."*

This stud was founded in the year 1787 by King Frederick William II. on a plan laid before his Majesty by his Master of the Horse, Count Lindenau. It is situated 45 miles from Berlin, a mile from the village of Neustadt. Its area is 660·035 hectares, and is composed of—

	Hectares.	About Acres.
Cultivated land - - -	150·	372½
Meadow - - -	214·685	533¼
Pasture - - -	200·	497
Wood - - -	32·936	82
Water - - -	22·136	55
Gardens, roads, &c. - -	5·962	15
Built on - - -	34·313	85

History, &c. The first mares brought to the stud, 19 in number, were purchased in England by an Irishman named Donough O'Grady in 1787, and, in the following year, 10 Prussian and 19 Mecklenburg mares were added, followed in 1789 by a further lot of 12 mares, brought from England by Donough O'Grady, who in the same year was made director of the stud. Of the nine stallions used from 1787 to 1791 only two, *Culblanc*, by an Arab horse out of an English mare, and *Mahomet*, described as being of Arab origin, were of any good, and the remainder were half-bred English or of unknown origin. No good result came of this unmethodical mode of breeding, and the master of the horse decided to follow the fixed rule of getting as well bred mares from England as possible, and to use only Arab stallions. O'Grady procured five mares from England, supposed to be thoroughbred, one of which only, "*Gentle Kitty*," was in the stud-book, and eight others tolerably well bred. "*Gentle Kitty*" cost 253*l.*, and the cheapest of the half-breds, 30*l.* Others followed, chiefly of English race, supplied by a dealer named John Taylor, and two stallions were purchased from Prince Kaunitz in Vienna: *Armidor*, Arab, a well-proportioned horse, though small, and *Isis*, Arab, who left good progeny. In 1791 an expedition was sent to Syria to buy Arab horses, and of many which were purchased between Damascus and Aleppo, 11 reached Europe, 5 of which died shortly after, having caught a species of glanders on the journey. Of the remainder, two, *Bayan* and *Mokraby* distinguished themselves the most, the progeny of the former being large in size. He was lost in the retreat of the stud to Lübeck in the year 1806, after the battle of Auerstadt. The stallions brought from Syria were nothing like as good as two brought about this time from Prince Kaunitz's stable. The first was "*Persianer*," of old Persian origin, standing 15 hands 2 inches. He remained till 1794 and then was sent to Trakehnen; the other was "*Turk Main Atty*," said to be 16 hands high. Prince Kaunitz had received him as a present from the Empress Catherine of Russia, and gave him to Count Lindenau, begging him to utilize such a valuable animal. He had formerly offered to sell him to the Count, but the veterinary surgeon sent to Vienna to report on him gave an unfavourable account, and nothing came of it. He was shown to the Turkish ambassador in Berlin, who, when asked his opinion, merely remarked "*Turk Main Atty*," a "turkoman horse," and thus he came by the name.

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* Deutsches Gestüt Buch.

He was bay in colour, with a small crescent-shaped star, which descended to most of his progeny. His only fault was being a little too long in the leg,* but he was a most beautiful animal. His progeny founded the reputation of the Prussian studs. The following years brought some good mares to the stud. In 1792 a lot of 14 thorough or well bred mares arrived from England, and in 1793 the first mares bred in the stud were drafted into it as brood mares. In 1806, after the loss on the battle of Auerstadt, the stud retreated but too late to be saved, and all that remained were captured after the capitulation of Blücher's army. *Turk Main Atty*, having injured one of his pasterns, was left behind and kept concealed, soon, however, to be discovered by some French marauders, by whom he was cruelly maltreated, dragged along, and he died soon after. The stud ceased to exist just when really excellent results were being obtained; 59 of the mares died on the march. In 1810 it was again started, and till 1833 horses of oriental origin and English mares, partly thorough-bred, partly half-bred, were used. Since then English thorough-bred stallions have been introduced, and thorough-bred mares imported, and gradually thorough-bred stock came to be raised. Since 1845, when a training stable for 36 horses was built, horses are trained and take part in races. Up to 1866 the Anglo-Arabian horses were bred as well, a stud of 40 brood mares being kept for the purpose, but in this year all the thorough-bred stock in the three principal studs were united at Graditz, and half-bred stock sent in their stead. Well bred horses of the hunter type are now reared in this stud.

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* The peculiarity of large size, with the fault of being a little leggy, is actually common to Turcoman horses to this day. Lieut. Gill, R.E., who has lately returned from Turkestan, having gone there with Col. Valentine Baker, late 10th Hussars, and Capt. Clayton, 9th Lancers, informs me that horses of a stamp not unlike our English thorough-breds are to be met with, sometimes standing as much as 17 hands, with the characteristic of being usually rather long in the leg.

TRAKEHNEN.*

The Royal Government stud of Trakehnen is situated near the village of the same name in East Prussia, on the Eastern Railway. The whole domain has an area of 3978·63 hectares, (about 9549 acres) and there are 12 stud farms, as follows:—

At Bajohrgallen are brood mares with their foals.

Birkenwalde is for 55 three-year old fillies.

Burgsdorfshof for 25 two-year old fillies.

Danzkehmen houses the four-year old mares.

In Guddin the chestnut brood mares, besides 20 yearling colts.

In Gurdszen are the black brood mares, and their weaned and yearling progeny, as well as about 20 two-year old colts.

In Jodszlauken are 60 two-year old colts.

In Jonasthal are 100 two- to four-year old colts.

Kalpakin has the bay brood mares, and their latest offspring, and there is room for 20 yearlings besides.

Mattischkehmen has two- to four-year old colts.

Taukenmischken has the yearling fillies, and in Trakehnen the stud stallions are kept, the Trakehnen mares and their last offspring. There are 15 stud stallions and 300 mares, viz., 70 of the light riding horse stamp of all colours in Trakehnen; 50 of weight carrying class and light carriage, of all colours in Bajohrgallen; 60 bays of heavier carriage stamp in Kalpakin; 40 chestnuts of heavier carriage stamp at Guddin; and 80 blacks of same class in Gurdszen. The stronger and older foals are weaned at the beginning of August, the remainder at the beginning of September. The sexes are separated at from five to seven months old. The pasture time lasts about four months. In the winter the mares and foals are exercised, weather permitting, from one to two hours, and the stud stallions are ridden every day. With regard to food—

~~The stud stallions~~ get from 1st January ~~till 30th June~~
12 lit. corn, 4 kil. hay, and the rest of the year 9 lit. and 4 kil. respect.

The test stallions, 9 and 5 lit. and 6 and 5 kil. as before.

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* "Deutsches Gestüt Buch" herausgegeben von J. v. Schwartz und A. Krocker.

The brood mares from 1st Jan. till 25th May, and from 1st Oct. till end of year, 3 lit. corn. From 20th May till end Sept., ½ lit. corn.	6 kil. hay the whole year.

The four-year old stallions get 9 lit. corn, and 5 kil. hay the whole year.

The four-year old mares get .7·5 corn, and 5 kil. hay the whole year.

History, &c.

The yearlings, two- and three-year olds, get during pasture time, 3 lit. corn, and the rest of the year 6 lit. corn and 5 kil. hay. The suckling foals get from 1st Feb. till 30th June 1½ lit. corn, and from 1st July till 31st August, 4½ lit. corn, and 4 kil. hay, and from 1st September to 31st December, 6 lit. corn, and 4 kil. hay. The history of the stud dates back to 1725 when King Frederick William I. ordered the manors of Trakehnen and all the other stud farms now belonging to it, to be drained and cleared in order to unite the various Government studs of Balga, Batriken, Brandenburg, &c., in one place. This was done in 1732, and they numbered all told 1,101 head, of which 513 were brood mares. In 1739 the king presented the stud to the Crown Prince. The first noteworthy stallions were, a Neapolitan, a grey from Vienna, and the English horse *Perle* which the King presented to the stud.

In 1739, a grey Persian stallion which the Duke of Courland had presented to the king came to the stud. He served nine years, and nearly all his progeny became in turn excellent stud stallions. In the same year the king presented the grey English horse *Haake* and the Spanish horse *Rheinsberger* to the stud, which numbered at that time, all told, 1,095 head, with 51 stallions and 368 brood mares. Until 1789 no foreign mares were introduced. In 1786 Count Lindenau became the director of the stud, and its state cannot have been very satisfactory, for 144 brood mares were immediately drafted out on account of spavin or curb, or through not being sufficiently roomy in barrel. The remainder were divided up into four herds, and these remain till the present day. On the occasion of the retreat of the stud to Russia in 1806, many of the best mares were lost at a place called Szawlen, and on their return the number was but 180. The stud suffered in the retreat in 1813, and still further through the assistance it rendered in re-establishing the Frederick William stud. In 1814 Herr von Burgsdorf took up the direction of the stud, and with great energy and ability, although he wavered some time in his choice of the principal stallions, giving preference first to oriental, then to

English, then back to oriental, and lastly deciding for stallions of English blood. This indecision was of but little consequence, however, as he never bred from any but perfectly sound animals. With regard to the stallions used since 1800, in 1799 the first son of *Turk Main Atty* (see Friedrich-Wilhelm stud) came to the stud. He was followed time after time by 16 other sons of the "Turkoman horse," 11 of which remained in the chief stud, five being handed over to the stud of travelling stallions. They benefited the stud greatly, and of the progeny left 141 brood mares, whose service added together makes a total of 946. In 1800 there were four pure Arabs in Trakehnen as follows—

No. of Years in use.	Name.	Brood Mares generated.	United period years used in stud.
11 -	*Delne* - -	15	144
6 -	*Dschuffi* -	3	14
13 -	*Benesacher* -	6	51
3 -	*Yemen* - -	6	42
Total 33 -	4	30	251

At the same time the following horses served as per table—

No of Years in use.	Name.	Brood Mares generated.	United period years used in stud.
3 -	*Black Bolton*	9	35
1 -	*Strubberg* -	2	16
13 -	*Ormond* -	24	171
6 -	*John Bull* -	13	118
Total 23 -	4	48	340

Orinoco, an English half bred which arrived in 1805 served 11 years, and of his progeny 47 became brood mares, which served for a united period of 482 years. At that time there were no English thorough-breds at Trakehnen. From 1806 to 1810 *Saxoni,* a thorough-bred, saved from the wreck of the Frederick William stud served, and of his progeny seven brood mares served a united period of 70 years. In 1817 horses were brought from England and Turkey, and from 1826 until the present day thorough-breds have been regularly introduced as well as some Arabs and English half-breds. The following horses were purchased from the year 1817 to the present day:—

English thorough-breds.—In 1818, *Amber, Mungo, Scrap-all;* 1819, *Blackamoor;* 1822, *the Cryer;* 1824, *Babeça;* 1827, *His Grace, Portland, Waterman, y. Whalebone;* 1834, *Malek-Adel, y. Whiskers, Peter Pindar;* 1836, *y. Partisan;* 1837, *Big Ben, Gulliver;* 1838, *Black Hambledon, New Light, Rioter;* 1839, *Mickle Fell, Snyders;* 1840, *Colonel Peel;* 1841, *Locomotive;* 1843, *Emilianus, Mundig;* 1845, *Great Mogul, the Corsair;* 1848, *Beyrout;* 1853, *Sahama, Stilton;* 1861, *Vindex;* 1864, *Fazzoletto;* 1866, *Lélid.*

Arabs.—1818, *Bagdadly Delyasdehr* (Turcoman), *Eminlick, Kiurd-arab, Oglan, Teheran;* 1820, *Altin, Kasch;* 1827, *Nedjed;* 1828, *Barak.* The service rendered by these horses is to be found in the work from which I am now quoting, and is too lengthy to introduce here.*

RADAUTZ.†

The Imperial Austrian government stud of Radautz is situated in the Bukowina, below the foot of the north-eastern slope of the Carpathian range, about 35 miles south of the chief town Gernowitz. The whole length of the property in possession of the stud is about 76 miles from east to west, and through the great changes of elevation from the valley of the Sucsawa 900 feet above the sea, to the top of the Luczina, 5,196, the climate varies over the whole extent. The western portion consists almost exclusively of forest and mountain pasture. As Bukowina is unprotected from the icy winds from Russia, the climate is rigorous, and the crop of Indian corn, the staple produce of the district, is often damaged by late frosts or sudden changes of temperature. The head-quarters of the stud is in Radautz, a town of about 8,000 inhabitants. Stalls for 212 stallions are in the immediate neighbourhood of the commandant's dwelling, and the nearest stud farm is Wadu Wladika, a quarter of a mile off. There are four other principal stud farms at various distances from head-quarters, and a summer station at Luczina some 60 miles off, whither all the mares and foals fit to travel are sent to pasture in the mountains, their grazing ground some 4,000 acres, being from 3,000 to 4,000 feet above the level of the sea. During their stay at

Topography.

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* Deutsches Gestüt Buch.

† For much of the information I have been able to collect about this stud I am indebted to our military attaché at Vienna, Lieut.-Col. Goodenough, R.A.

Luczina, they are never driven into the sheds built to shelter them except under exceptional circumstances of cold and snow.

No horses are so much esteemed in the Austrian army as those bred at Radautz, and every officer seems proud to have one. It bears the same relation in that respect to Austria as the Mezöhegyes stud does to Hungary.

Effects of climate, &c.

Their undoubted excellence may be ascribed to their being pastured during the dry summer months in the mountains. In addition to the excellent pasture and invigorating air they become clever through climbing about, and the journey to and fro accustoms them to strange sights and sounds, crossing water, &c. It is to be deplored that in consequence of the occasional loss of valuable animals, it is a question just now whether this system shall be discontinued. Before the year 1774 the re-mounts for the cavalry were purchased by regimental officers, and one of them, Ober-lieutenant Cavallar of the Imperial Chevaux-legers regiment, showed such judgment in his selection, that the ministry of war handed over to him the duty of purchasing re-mounts for the whole army. They gave him a dwelling at Kotzmann in the Bukowina and the necessary staff. Up to the year 1783, 13,979 head were purchased by him, and his head-quarters were then shifted to Waskontz. From 1783 to 1792 the large number of 16,236 horses were purchased, partly in Galicia, and the Bukowina, and partly from far in the interior of Russia and the Ukraine. The large number of horses on their hands made it necessary to have several depôts, and as the mares frequently foaled after being brought to the depôt, the ground already occupied was increased by the estate of Radautz, belonging formerly to the monasteries Putna, Suczawitza, Solka and St. Illie, in order to be able to pasture them, and on account of the cheap forage obtainable. The villages of Strasza and Wikow, and the mountain pasture Luczina followed, and different additions from time to time brought the estate to its present large dimensions. Excellent animals were often brought from Persia, Circassia, and the inner part of Russia, and the mares which happened to be in foal remained behind, and were bred from in the stud, and these were added to by drafts of Turkish, Transylvannia and Lippizza * horses. Up to the year 1822 the stud was quite wild, and after that they were gradually taken in hand and tamed, though that process was attended at first by a falling off in fecundity. In 1827 the number of brood mares was 350, in 1829 380, in 1831 it was increased to 400 and in

History.

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* See "Imperial Stud, Lippizza."

1842 to 500. The stud possessed at that time many original Arabs, and others of pure blood from Bábolna or Mezöhegyes,—*Shagya, Tscheleby, Fedchan, Gidran, Samhan, Duhers, Mesrour, Siglavi, Abugress, Kader, Assed, Feridjan, Nedsdi-Baba, El-Bedavy,* &c. This last came in 1843 from Bábolna. He is the father of the family which bears his name. He served 15 years in the stud and left a numerous and excellent progeny. The revolutionary epoch of 1848 did not pass unnoticed in this remote corner of the empire, and the retreat of the stud which took place during very severe weather, exercised an evil influence on the younger animals, which could be traced long after. In 1856 a stud of that excellent breed the Huzzul was formed in the Luozina range, and two Szekler stallions of that breed and eight mares introduced, and their male progeny stationed in various mountain villages, by which this excellent breed which was almost extinct, revived again. In 1872, on the occasion of the visit of Lieut.-Col. Goodenough, there were the following stallions English, Norfolk, Anglo-Norman, an excellent small Norman from M. De la Ville's stable, a black Arab called *Daghoman*, from Bábolna, an Arab from Prince Sangusko's stud, a white one from Mezöhegyes, an original Arab *Hafiz*, the gift of the Sultan, a bay Arab, and a white original Arab, and three Lippizzaners, &c. There were 300 mares; in 1871 200 animals from one to four years old were sold. The three-year olds were a good looking lot. The yearlings fetched on an average 200 florins, and the four-year olds 500 florins; 80 horses were handed over to the depôt of travelling stallions. There are 20 stallions in a depôt near Radautz and 300 more in two depôts in Galicia. The old Radautz mares showed to advantage along side of mares recently transferred from other studs. Of the young stock the Arab and De la Ville were the best; of the English, the *Revolvers* pretty good, and the other English indifferent. The sight of the place is the Schimmel Gestüt, or stud of greys; 90 grey mares of uniform stamp, 15–2 to 15–3, high-tailed, broad-hipped, big-boned, big-headed, but good shaped heads. These are the real Radautz breed, reddish flea-bitten greys, "reminding me" (says Col. Goodenough) "of our older Persian horses in the artillery in "Bombay. Many of these animals are reputed to be of "Turkoman extraction. One sees in the Bukowina some "pack-horses which have a smack of the same blood and "colour, though reduced by bad nourishment. These very "likely furnished some of the original mares to the stud. "There is good stuff in this part of the country, witness "the excellent breed of Huzzulen ponies. My impression

" after seeing the stud was strong of the good results which
" may be had by raising stock from small horses of vigorous
" constitution (with the aid of mountain pastures), under
" circumstances of soil and climate, and the resulting keep
" and care analogous to, but rather better than that to
" which the breed was originally accustomed. Thus the
" English horse coming from a richer country and circum-
" stances is said to, and I thought does, deteriorate, while
" the Turko Spanish breed (coming from Arabs which have
" sojourned in Turkey) and Spanish-bred horses in Lippizza
" improve, coming as they do from worse to better care, the
" food in some respects better, and the climate vigour-
" inspiring though severe. The horses may be in the
" mountains for from three to four months. They run on
" the farms but find little pasture from September till snow
" falls. Snow and frost prevail from end of November till
" end of March, and they do not get natural pasture again
" till the end of April. N.B.—The English horse has done
" well in Australia where the climate at least is finer than
" ours, less well at the Cape, perhaps because the keep is
" deficient and climate too arid."

LIPPIZZA.

The Imperial stud of Lippizza, the property of the Emperors of Austria, is situated about five miles from the seaport town of Trieste. The stud itself was established as far back as the year 1580, and the present race of Lippizza horses has existed since that time.

History.

In the year 1680 the Archduke Charles of Austria, third son of the Emperor Ferdinand I., ordered the present site of the stud to be enclosed by a wall. The Emperor Charles VI. bought in 1711 the Adelsberg estate from the princely family of Auersperg, and attached the present stud of Pröstraneck on that property in the year 1736 to Lippizza as an offshoot. During the hostile occupation from 1809 to 1815 the stud was sent off to Petska in Lower Hungary, and it suffered in consequence of the change, but regained its former excellence on its return to Lippizza. The Lippizza horses originated in all probability in Polesina, which is not far distant, and where horse breeding flourished. In the 17th and 18th centuries a considerable number of horses came from Spain and Naples, besides Arabs. The whole area of the property is 6,286 acres, the land is very stony, giving but scanty herbage, but in some places growing capital hay, and the climate is dry and healthy. The mares graze from the middle of March till the end of October, and are fed with oats at the same time.

The breed which is an exceedingly sound and useful one is a mixture of Spanish and Arab blood, the latter predominating, the former showing itself in the head, which is generally rather Roman nosed, and the thickness of the crest; they are rather stouter than the Arabs, and bigger in the bone. The Arabs and Lippizzaners give a very good cross, and are used as light carriage horses, (and at court often in teams of six), possessing great speed, endurance, and activity. The prevailing colour is grey, but sometimes they are met with brown and black. The Lippizzaners of original breed are used both as riding and driving horses; at court principally the former, being ridden in the Spanish school.

The stud stallions at present in Lippizza are six in number, viz.:—

Pure Arabs - - - -	2
Half-bred Lippizza and Arab -	2
Pure Lippizza - - -	2

The number of brood mares is 68, viz.:—

Pure Arabs - - -	10
Lippizzaners - - -	26
Half-breds - - -	32

Of the Arab mares more than one would cause some doubts as to the real purity of the breed, while others are very handsome, and possess all the characteristics of the Arab. They are all of them, however, bigger than the general run of that race, and I do not think that any were under 15 hands, and some as much as 15–1, or 15–1½. The Lippizza breed is represented in all the breeding studs throughout the Austro-Hungarian empire, and the stud stallions are used, as in the case of the pure Arabs, in those districts where oriental blood prevails, their progeny being very fast and active as well as enduring. The race is divided into five different families, viz., the *Conversano's*, *Majestoso's*, *Pluto's*, *Favory's*, and *Neapolitano's*; and though in the lapse of time it would be reasonable to suppose that all distinctive trace of family would be lost, yet this does not seem to be the case, as the *Conversano's*, are esteemed the most, and after them the *Majestoso's*. Of the lot, 15 or 20 had foals at their foot on the occasion of my visit. After the foals are weaned they are drafted out of the parent stud and sent to Pröstraneck, about two hours distant by rail, there to remain till after their third year, when they are sent to the Imperial stud of Kladrub, in Bohemia, and trained to saddle or harness, as the case may be, for the use of the Imperial stable. At Pröstraneck they enjoy the advantage of getting first rate mountain pasture, which in the lapse of years has no doubt contributed to some extent to make them such a useful and active breed.

KLADRUB.

The Imperial stud of Kladrub is situated about 1½ miles from the little village of that name, about 30 miles to the east of Prague in Bohemia.

Topography, &c.

The estate contains 1,727 acres, of which 1,579 are meadow, 88 timber, 60 parcelled up among the hands employed on the stud, to enable each to keep a cow, and grow the necessary garden produce (as it is quite impossible to get supplies elsewhere than what is grown on the spot); 16 are told off as pasture for the cattle employed generally, and the remainder is covered by buildings or gardens, or is unproductive ground. The soil is very light and in some places nothing but sand. The timber consists chiefly of Scotch pine (*Pinus sylvestris*).

History, &c.

This stud is interesting not only from the fact of there being such excellent and numerous thorough-bred stock, but also because here only, in all Europe, is bred that race of big Spanish horse which is so often seen in the pictures of Wouvermanns, Salvator Rosa, &c., none of them under 16 hands, with very large Roman nose heads, and mighty crests, with long but clean legs, and high stepping action, without any pretension to speed, with bushy tails kept long, and the hair of which is very wavy from half way down to the tip. Animals adapted for great state occasions, and when seen in their splendid trappings, having a most imposing and dignified appearance, to which their otherwise ugly heads seem to lend no inconsiderable share. King Maximilian II. of Bohemia, and his successors, Rudolph II. and Mathias, brought horses from Spain, and put the most suitable animals to the, at that time, small stud at Kladrub. Since that time, some 300 years ago, the Spanish breed has been kept up in all its integrity. Besides the thorough-breds and the Spanish breed, which are called by the family name of Sacramoso, but are generally known simply as the Kladruber breed, a large number of half-bred English horses are bred, and some Anglo-Normans, besides a good many mules. The thorough-bred stallions and many of the mares, both thorough-bred and half bred, and the young stock in training are housed at what may be called the head-quarters, near the commandant's dwelling, offices, &c.; the young half-breds up to three years old, and thorough-bred colts not yet in training being housed in a separate stud, distant a mile, built on three sides of a square, and consisting of sheds (built of stone and closed in on all sides), in which they roam at leisure, except at feed time, when they are tied up. The larger number of the thorough-bred mares are kept in loose boxes built in compact blocks about 200 yards from head-quarters, and here close at hand is the stud of Kladrubers.

Major Löffler, the present commandant of the stud, very kindly accompanied me round the stables, commencing with those at head-quarters. Among others were— Stallion.

Virgilius - -	by *Voltigeur*, out of *Eclogue* (by *Emilius*).
Challenge * - -	by *Trumpet*. *Princess Alice*.
A three year old, *Springy Jonathan* -	by *Starke*. *Elastic*.†
Corsair, three years -	by *Buccaneer*. *Zeta* (by *Melbourne*).
A five-year old -	by *Cotswold*. *Vanity*.
Pirate Chief - -	by *Buccaneer*. *Lady Tatton*.

Of four yearlings being trained to the saddle, one by *Challenge*, out of *Miss Bowzer* (*Lady Elizabeth's* dam), was an immensely powerful colt, and Mr. Jackson, the Emperor's trainer, is sanguine as to his future success on the turf. There is one so called Norman stallion, named *Deucalion*. He is by the thorough-bred horse *Don Quixote*, out of an Anglo-Norman mare; a very powerful horse not bearing many signs about him of his aristocratic descent, but a most useful stud stallion. His progeny are really fine animals, intended to do duty as carriage horses, and showing none of the coarseness of the sire. Major Löffler bought him in Normandy, and was induced to do so through seeing some instances of his success as a sire, with which he was very much pleased. He has had no cause to repent his purchase. All the mares and foals seem to be as docile here as at the other studs I visited. In the yard, on quitting the stable, we found a herd of 20 or more half-bred mares on the point of being taken out to exercise. Two mounted men attended them, one in front and the other in rear, and as the meadows were too hard frozen to turn them out, they were taken along the road, quietly following their mounted leader, and giving no sort of trouble. At the same time young Lippizza remounts destined for the Emperor's stable were being broken to harness. All his Majesty's horses are trained in Kladrub. We then drove to the outlying stud farm, Franzenshof, distant two miles, and inspected the young stock. Among animals of all the breeds, including mules, a very handsome young *Blair Athol* colt was pointed out to me. The name of the dam has escaped me. The young Kladrubers were remarkable for their ugliness, all the defects seeming to be exaggerated, and they had not yet attained to the roundness of contour that distinguishes the breed. The mules are very fine animals, all bred from Kladrub mares. Two big stallion donkeys are kept for the purpose. On our way back we had an opportunity of seeing the two-year olds entered for next year's Austrian Derby, taking their gallop. They were—

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* All his progeny are excellent.
† Elastic was shot lately.

Two-year olds training.

COLTS.

Mulcibere, by -	*Challenge.* *Ugly Doe.*
Crossbower, by -	*Cambuscan.* *Golden Drop.*
Hora, by - -	*Thunderbolt.* *Golden Star.*
Brown Colt, by -	*Challenge.* *Elastic.*

FILLIES.

Silvertail, by -	*Ostregor.* *Fairy.*
Phrygia, by - -	*Marsyas.* *Guinea* (by *Flying Dutchman*).

The grass was not fit, the ground being too hard, and the exercise was taken on a sanded road leading round the edge of a large field about three-quarters of a mile long. The biggest of the lot was *Hora*, a powerful looking chesnut, spoilt, however, by very slack pasterns, in consequence of which the base of the fetlock joint seemed to touch the ground at each stride. The whole of the estate is perfectly flat, and Mr. Jackson regretted much not having the chance of letting them canter up-hill to work their hind quarters a little more. The whole of the Austro-Hungarian empire labours under the disadvantage of there being a large portion of the year during which the ground is too hard to allow of efficient training, so much so that of two equal horses one trained in England and the other in Austria, the latter has no chance in a race against the former. I am told that as many as 16 of the horses entered for the Austrian Derby of 1874 are being trained in England! In the training stud are seven two-year olds and seven yearlings.

Brood mares.

In the afternoon the business of inspecting the thorough-bred mares, and Kladrubers was gone into.

The thorough-bred mares are—

Chaperon, 12 years old	*Newminster.*	*Governess.*
Naiveté	*Stockwell.*	*Artless.*
Effie	*Wild Dayrell.*	*Phemy* (by *Touchstone*).
Golden Drop	*Stockwell.*	*Hop-picker.*
Aunt Hannah	*Newminster.*	*Flighty.*
*Miss Bowzer**	*Hesperus.*	*Mangostine.*
Red Pole†	*Orlando.*	*Little Finch.*
Violet	*Voltigeur.*	*Garland.*
Tini	*St. Giles.*	*Taurina.*
Kate Caradoc	*King Caradoc.*	*Daisy.*
Matilda	*Newminster.*	*Bathilde* (by *Stockwell*).
Hero	*Blue Jacket* (by *Sheet Anchor*).	*Sévigné.*‡
Golden Hair	*Orlando.*	*El Dorado.*
Guinea§	*Flying Dutchman.*	*Payment.*
Vanity‖	*Bantam.*	*Coquette.*
Juno	*Rifleman.*	*Hetman Platoff mare.*

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* Lady Elizabeth's dam.

† Mother of Jackson and Drum Major. Redpole came to Kladrub with Jackson at her foot, in foal to Kettledrum with Drum Major, who among other triumphs won the Austrian Derby in 1872.

‡ Sévigné died here in foal 21 years' old.

§ Own sister to Dollar.

‖ Foaled in 1853.

Erin -	*Macaroni.* *Fairy.*
Josel -	*Parmesan.* *Miss Bowzer.*
Lady Bees -	*The Duke.* *Miss Bowzer.*
Reconnaisance	*Stockwell.* *Sortie* (by *Melbourne*).
Melia -	*Ostregor.* *Niobe*[*] (by *Orlando*).
Ugly Doe -	by *Ugly Buck.*

There are two more whose names I did not note. In all 24 thorough-bred brood mares, two in each loose box. The number of half-bred mares is 45.

Of this year's foals there are all told 40, while of yearlings (foaled in 1872) there are 46; two-year olds 41; three-year olds, 37; and four-year olds, 39.

Kladrub breed.

The stud of Kladrubers which we next inspected contains a constant number of 12 white mares and 12 black. They are all together in one large stable, in which they wander about at will except at feed time. Four stallions are kept for breeding purposes, two of each colour to avoid too much in and in breeding. The breed of blacks are never used except for the funerals of members of the Imperial Family. My thanks are due to Major v. Löffler and Mr. Jackson for the kindness they showed accompanying me and affording every information. Major Löffler accompanied Colonel (now General) Baron von Brudermann on his expedition to Syria, Palestine, and the desert during the years 1856–57, and has written a very interesting work giving a most graphic description of their hardships and successes. From being a most enthusiastic admirer of the Arab, as the ne plus ultra of all equine good qualities, he has long since been convinced that there is nothing to equal the English thorough-bred horse. With such splendid stock around him it would be strange had it been otherwise.

Kisbér (History, &c.)

Topography, &c.

The Royal Hungarian government stud of Kisbér lies in the county of Komorn, close to the station of the same name. The whole area of the domain is about 1,562 acres, and the soil is for the most part very good, though in the absence of sufficient rain it is almost too hard for the horses, and too

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[*] Sévigné came to Kladrub in foal with Niobe, who was destroyed eight days before my visit.

History.

much rain renders it very liable to be cut up. Some portions of the estate, of which a considerable part consists of plantations which thrive exceedingly well, are favourably situated for stud farms, but the home farm and some of the outlying ones are much complained of by the commandant (Col. v. Soest) as being peculiarly exposed to the prevailing winds, and but too often subjecting their occupants to influenza and colds. The thorough-bred weaned foals which were formerly housed in the home farm have been removed some three miles off to the only farm fit for them to occupy, and as they require and receive the greatest care and personal attention from the commandant, he paying them a daily visit in all weathers and seasons, I could quite sympathise with the wish he expressed to build another stable for them nearer home on a very favourable spot which he pointed out. There was in former years a training ground, but it has been done away with and all the thorough-bred stock are now sold as yearlings by auction, the natives of the Austro-Hungarian empire only being allowed to bid for them. The stud was formed in the year 1853, the estate being bought from the princely family of Batthyany. The last resident possessor was the unfortunate Prince who was a victim of the Hungarian rising of 1848. The buildings on the estate, which formerly pastured sheep only, were adopted as economically as possible for the reception of the stud, only those buildings which were absolutely necessary being built. The first thorough-bred stallion was Deerslayer, bought from M. v. Csapodi, then five brood mares, four young mares, one two-year old, and three yearling fillies, two two-year olds, and three yearling colts, two suckling colts, and 1 suckling filly, all of English or Arab race were purchased for 1,400*l.* 22 head in all and draughted into the stud. On the 1st October 1854, the following thorough-bred brood mares were sent from the Government stud of Piber; *Frolicsome, Misfortune, Maria, Queen of Beauty*, and *Camilia*, and the two-year old mare *Orlanda* and the stallion *Lord Saltoun* from Mezöhegyes, and in the same year the mares *Annette* by *Bedford, Amiable* by *Gallopade* and *Opal* by *Bob Peel* were bought from Count Hunyady; in 1855 came the thorough-breds *Revolver, Grapeshot,* and *Chief Justice,* three others including *Lord Saltoun,* being drafted out. Among other acquisitions in the course of time, in 1855, Major General Ritter bought 12 mares, many with foals at foot, and one, *Apple Blossom,* with a colt by *Touchstone,* and amongst others in 1860, *Fairy, Music,* and *Flageolet,* and in 1861, *Donna del Lago.* In 1862 General Bruderman bought *Teddington* and *Daniel O'Rourke,* and the blood mares *Catastrophe, Caliope, Pauline,* and *Pyrrha* in foal with the stallions *Exact*, *Æsopus*, and *Marco Polo*. *Honeysuckle* was also bought this year. On Sir Tatton Sykes' stud being brought to the hammer, the General secured 36 brood mares for Kisbér. From 1864 nothing but thorough-bred and Norfolk stock have been used in the stud, and it is impossible to bring within the limits of this report a detail of the various arrivals from England. Among them *Pride of England*, a roan Norfolk horse, parent of the stock of the same name, is a noteworthy animal as he has handed his qualities down to his excellent progeny. *Norstern* of the same breed but handsomer than *Pride of England*, also deserves mention; he was bought in England by Mr. Cavaliero.

Brood mares. System of stabling adopted.

On my arrival at Kisbér what yet remained of daylight was utilised in visiting the thorough-bred mares. There are 36 of them, housed in 18 double loose boxes. The ground which is park like in character is divided up into 18 paddocks each about 150 yards long and 30 broad, and at the upper end of each are two loose boxes side by side, opening (to the south) into a sanded yard. The great principle of plenty of fresh air is carried out throughout the whole stud in all its integrity, the doors of the loose boxes being never closed throughout the whole year, and as these are very large there is no lack of ventilation. When necessary the mares are confined to their box by means of bars across the doorway.

They are as follows:—

Alix	by *Alert*	out of a *Phœnix* mare.
Assiduity	„ *Stockwell*	„ *Plenty.*
Beeswing	„ *Newminster*	„ *The Sphynx.*
Caroline	„ *Ivan*	„ *Coquette.*
Catastrophe	„ *Pyrrhus the 1st*	„ *Burlesque.*
Charmian	„ *Ton*	„ *Little Fairy.*
Crafton Lass	„ *King Tom*	„ *Mentmore Lass.*
Cricket	„ *Flying Dutchman*	„ *Wicket.*
Crisis	„ *Saunterer*	„ *Catastrophe.*
Dahlia	„ *Orlando*	„ *Peri.*
Deception	„ *Orlando*	„ *Trickstress.*
Donna del Lago	„ *Lord of the Isles*	„ *Jeremy Diddler* mare.
Donna Maria	„ *King Tom*	„ *Ma Mie.*
East Sheen	„ *Kingston*	„ *Miss Slick.*
Esther	„ *Oakball*	„ *Niobe.*
Fancy	„ *Orlando*	„ *Ossifrage.*
Fantail	„ *Wood Pigeon*	„ *Beechnut.*
Fern	„ *Bois Roussel*	„ *Switch.*

Firefly	by	*Orlando*	out of	*Twitter.*
Flytrap	,,	*Flying Dutchman*	,,	*Birdtrap.*
Gratitude	,,	*Newminster*	,,	*Charity.*
Honeybee	,,	*King of Trumps*	,,	*Honeydew.*
Imperatrice	,,	*Orlando*	,,	*Eulogy.*
Java	,,	*West Australian*	,,	*Toilette.*
Lady Elizabeth	,,	*Trumpeter*	,,	*Miss Bowzer.*
Lanceline	,,	*West Australian*	,,	*Cossack Maid.*
Merry-go-round	,,	*Trumpeter*	,,	*Maypole.*
Mildred	,,	*Rataplan*	,,	*Merry-go-round.*
Mineral	,,	*Rataplan*	,,	*Manganese.*
New Victoria	,,	*West Australian*	,,	*Calcavella.*
Peeress	,,	*Chanticleer*	,,	*Baroness.*
Silkstone	,,	*Touchstone*	,,	*Snowdrop.*
Sophia Lawrence	,,	*Stockwell*	,,	*Mary Aislabie.*
Thalestris	,,	*Kingston*	,,	*Virago.*
Teresa	,,	*Kingston*	,,	*Molly.*
Vesta	,,	*Augur*	,,	*Cardsharper's sister.*

Deception and *Silkstone* arrived here from England in foal to *Blair Athol*, and their progeny, which I saw the following day, are perhaps the two handsomest colts of the lot they were among. *Lady Elizabeth's* notorious career is still fresh in men's minds. She has been unsuccessful with her offspring which are generally sickly in early youth, and she is unable to suckle them, seeming, though looking very well, to be broken down in constitution; and *Gratitude's* performance in so closely contesting both Cambridgeshire and Cesarewitch will be well remembered.

Stallions.

The next morning Lieut.-Colonel v. Soest the commandant conducted me to the stable of the stallions. The thoroughbreds are—

Buccaneer, bay, by *Wild Dayrell* out of *Little Red Rover* mare.
Ostregor, bay, by *Stockwell* out of a *Venison* mare.
Cambuscan, chestnut, by *Newminster* out of the *Arrow*.
Diophantus, dark chestnut, by *Orlando* out of *Equation*.
Polmoodie, brown, by *Melbourne* out of *Burlesque*.
Tarquin, black, by *Voltigeur* out of *Honeysuckle*.

Buccaneer is the best stallion in Austria. I am told that after being bought by the Austrian Government, large sums were bid to get him back to England. *Ostregor* is one of the best tempered animals it is possible to imagine. His groom does not hesitate to put his hand *between his teeth*, which he mumbles much as a playful dog would do.*

Cambuscan and *Diophantus* have both in their day been favourites for the Derby, and each made a creditable fight for the blue riband of the turf. The former it is to be regretted is decidedly calf kneed and is no very great favourite. He and *Buccaneer* served for 500 florins (50*l.*), until quite lately when the price was lowered to 400 florins (40*l.*) Besides the thorough-breds there are two horses of Norfolk breed, a brown, by *Pride of England* out of a *Sunderland* mare (No. 60), and another a bay bought in England called *Highflyer*. This latter is a very massive animal and is said to have grand action, though he looks a little heavy. We then saw six yearling thorough-breds being trained to the saddle in the riding school, the handsomest being, a liver chestnut, by *Daniel O'Rourke* out of *Julietta*. All these six have been sold to Baron Oppenheim, and preparations for their departure were being made at the time of my visit. *Daniel O'Rourke*, called universally *Daniel* for short, stood a long time in Kisbér. His progeny have never done much on the turf. He was but lately drafted out of the stud and has since died. We next drove out to a stud farm where 72 half-bred foals of this year were housed in a long and very roomy shed. Plenty of bedding is laid down and they wander about at will. A large paddock is attached, and they are taken out in favourable weather to pasture under charge of two czikos or mounted drivers. The next stud we drove to contained 66 two-year old half-bred colts. We inspected them in the paddock in which they were assembled on our arrival. There seemed to be some risk of their injuring each other in their gambols in such a confined spot, but I was assured that such was rarely or never the case. They were very well under control, however, as could be seen while they were being taken out to pasture, two men being quite equal to keeping the whole herd on a tolerably narrow track between two fields in which crops were growing, and which they avoided trampling very successfully. I may here mention that a donkey is kept in each stud in order that the young horses may get accustomed to them. He seemed always to get on very well with his companions, and indeed in the case of the last-named stud seemed to be rather a

Norfolk stallions.

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* He differs in this respect from Buccaneer, who has developed a man-eating propensity. He is quiet enough in his stall, but is dangerous in the riding school. Three days before my arrival he bit off one of his rider's fingers.

favourite than otherwise. The next stud contained the thorough-bred colts and fillies, 18 of the former and 15 of the latter.

THOROUGH-BRED WEANED FOALS.

Thorough-bred foals.

COLTS.

By	*Blair Athol*	out of	*Deception.*
„	„	„	*Silkstone.*
„	„	„	*Firefly.*
„	*Buccaneer*	„	*Fern.*
„	„	„	*Catastrophe.*
„	„	„	*Lancelin.*
„	„	„	*Mineral.*
„	„	„	*Lady Elizabeth.*
„	„	„	*Fancy.*
„	*Daniel O'Rourke*	„	*Juliet.**
„	*Diophantus*	„	*Peeress.*
„	„	„	*Sophia Lawrence.*
„	*Carneval*	„	*Mildred.*
„	*Grimston*	„	*East Sheen.*
„	*Ostregor*	„	*Imperatrice.*
„	„	„	*Silly.*
„	„	„	*Crisis.*
„	*Palestro*	„	*Comina.*

FILLIES.

By	*Buccaneer*	out of	*Dahlia.*
„	„	„	*Kate Tulloch.*
„	„	„	*Alix.*
„	„	„	*Fantail.*
„	*Diophantus*	„	*Switch.*
„	*Grimston*	„	*New Victoria.*
„	*Ostregor*	„	*Donna del Lago.*
„	„	„	*Pyrrha.*
„	„	„	*Turteresse.*
„	„	„	*Charmian.*
„	„	„	*Donna Maria.*
„	„	„	*Lotti.*
„	*Palestro*	„	*Crafton Lass.*
„	„	„	*Nymphe.*
„	*Virgilius*	„	*Palma.*

The colts occupied one half of a long shed, the fillies the other. A paddock about 50 yards broad runs the whole length of the stud. That portion allotted to the fillies' being separated from the other by a tall fence. A common gateway leads to an outer paddock about four acres in extent lately fenced off from the open plain, in it they are allowed to graze in favourable weather. With some difficulty the colts and afterwards the fillies were induced to leave the inner paddock for the larger one, but they became very wild during the process, and once outside, raced about in an excited manner for some time. They are rather encouraged than otherwise in this for the sake of exercise. There was one half-bred colt among them which in its infancy had been hurt by its mother, and it was amusing to see the efforts it made to keep the lead, in which it succeeded for some time by dint of extraordinary exertions, though it was unable to maintain it for long. This racing round and round had as it were the effect of sifting the herd. In a short time without seeming to be in the least anxious about the matter the Blair Athol-Deception colt had it all its own way, cantering smoothly along without effort. The ambitious half-bred struggled gamely along, though well in rear, to the last. Of the colts the most noteworthy were:

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* The last colt got by Daniel O'Rourke in the stud.

Most noteworthy foals.

By *Blair Athol* out of *Deception.*
„ „ „ *Silkstone.*
„ *Ostregor* „ *Imperatrice.*
„ *Buccaneer* „ *Fern.*
„ „ „ *Lady Elizabeth.*
„ „ „ *Catastrophe.*
Of the fillies by: *Ostregor* „ *Donna del Lago.*
„ „ „ *Donna Maria.*
„ *Grimston* „ *New Victoria.*

In the evening two studs of half-bred mares were inspected, 60 in each. Many are of Norfolk breed; this breed succeeds very well at Kisbér, and a pair of very even cobs which the commandant drove were excellent specimens, though much smaller than their sire. On Tuesday I was compelled to start for the stud of Bábolna, distant about 12 miles from Kisbér. My kind conductor sent a carriage on with my things to a point of the road distant about four miles and a half, where there was yet another stud of half-bred mares. There were 72 here, the yearlings occupying half the shed and the two- and three-year olds the other half. All of them were turned out and driven slowly round by the czikos. They were nearly all a good stamp of animal, useful, and many might have been chosen which had all the stamp of hunters. Here I parted from my kind friend to continue my journey to Bábolna.

BÁBOLNA.

Topography, &c.

The Royal Hungarian government stud of Bábolna lies in the county of Komorn, about 10 miles from the celebrated fortress of the same name, and four miles from the nearest railway station, Nagy-Igmánd. The soil is light loam mixed with sand, and the climate mild and healthy, though subject to dry storms, which are very detrimental to vegetation. The whole domain is planted here and there with belts of timber to break the force of the wind, the only trees to be seen on the vast plain, and they are valuable for firewood, which is extremely scarce in the whole district. The estate which has an area of 10,035 acres, is not farmed in the same style as those of Kisbér, and Mezöhegyes, fodder and grass being only cultivated. The principal block of buildings forms an oblong, about 240 yards long and 80 broad, with a covered riding school in the centre. The northern end of this block is occupied by the Commandant's (Major v. Friedrich), apartments, officers' dwellings, offices, &c., the remainder of the oblong contains stables, men's quarters, coach-houses, &c. Around this principal block are grouped the men's hospital (for 30 men) and doctor's quarters, the sick horse stables, the veterinary surgeon's quarters, the house of the directors of the farm, church, and small mill, &c. There are two other stud farms and two separate blocks of farm buildings on the estate, besides what may be called the home farm.

History

The stud was formed in the year 1789, by his Majesty the Emperor Joseph II., the estate being bought from the then owner Court Szapary for 450,000 fls. (45,000*l*.). Until the year 1806 it was a branch of the stud of Mezöhegyes, but after that time it was made a separate stud. The horses first used were of Oriental origin, Spaniards, Transylvanians, Normans, &c. Of the 21 Spanish horses nearly every one was bought in the years 1801–2–3, in Spain, as much as 150*l*. being given for one, a bright bay. Up to the year 1816 the only object aimed at seems to have been increase, not improvement. From that time Arab blood was introduced, and from then till this day as many as 80 horses and 72 mares of the most noble blood of the desert have been imported direct from the east. In the year 1815 six Arabs were brought from France, captured in the stud of La Rosière (at the same time as *Nonnius*), and *Siglavi-Gidran* a chestnut Arab was purchased in Trieste by Baron Fechtig for 1,800 ducats. He stood 14 hands 3 inches, and was the father of the *Siglavi* race, which has since become white in colour. He was of a savage disposition though a beautiful animal, and I am informed by Major Otto Mayr, the energetic compiler of the Austrian Stud Book, that he himself as a child saw this horse seize a man by the finger, which he tore off almost up to his victim's shoulder! * Among the names and different brands in the stud may be mentioned *Samhan* who came in 1819 costing only 30*l.*; in 1833 *El Bedavy I.-Hlavie*, and *El Bedavy II.-Koheil*, were bought by Baron Fechtig in Lengyel-Tothi for 252*l.* and 225*l.* respectively. In the years 1836–37 Colonel Herbert purchased in Syria nine horses among them the ancestors of the well-known *Schagya* family (180*l.*). The lowest price given was for *Kader* 94*l.*, and the highest 200*l.* for *Ebnelkar.* The same bought in 1843 six horses; the names are still kept up, so it may be interesting to some to know that *Achmar* cost 230*l.*, *Assil* 250*l.*, *Asslan* 100*l.*, *Elbas* 150*l.*, *Koreischan* 120*l.*, *Kuejes* 130*l.*, *Schamar* 80*l.* *Assil*, *Asslan* and *Koreischan* are particularly well known. In 1855 *Aga* was bought for 250*l.*, from the King of Würtemburg, and in 1857 *Aghil Aga* by General Brudermann. As an instance of the determination on the part of government to spare no expense, it may be mentioned that in 1860 *El Delemi* and *Atuan* were bought in Cairo for 460*l.* and 400*l.*, and *Zarif* in 1861 by General Brudermann for 600*l.* The most remarkable mares were brought in 1857 by General Brudermann from the east. Of the lot he brought over, 32 came to Bábolna, and they cost 10,025*l.*, the dearest being *Nemse* 600*l.*, and the cheapest *Schiehanie* 93*l.* In 1864 we find a mare *Elmina* costing only 80*l.* and five others 100*l.* each and then the same year *Gazlan* only 51*l.* and in 1865, another *Gazlan* mare and the mare *Hadudi* for 80*l.* apiece. These last were bought from the Imperial stud. An outsider could not have got them so cheap.

Arab stallions.

The pure Arab stallions at present in Bábolna are five in number:—

Abdul Aziz, brought from the Imperial Stable.
Padishah, brought from Schleswig.
Mahomet Ali, } born in Bábolna.
Jussuf, } born in Bábolna.

And *Amurad*, purchased from the Royal Würtemburg stable. There are five half-bred stallions (Anglo-Arabs). Of brood mares there are at present 123, of which 34 are pure Arabs. On the occasion of my visit, with the exception of the stallions, the whole stud was out at pasture. The business of inspection commenced with the stallions. *Mahomet Ali* a chestnut, by *Mahmoud Mirza,* is the handsomest of the lot. We then drove out to see the different lots; colts, two-year olds, yearlings, and weaned foals. They seemed to be very tame, allowing us to come up, and, indeed, meeting our advances half way. Most of these are descended from the Arabs brought from Syria, Palestine, and the Desert by Colonel (now General) von Brudermann.

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* He remained in the stud till the year 1833.

General von Brudermann's expedition to the East.

This expedition consisting of, besides the Colonel, one captain, one lieutenant,* a doctor, veterinary surgeon, and a non-commissioned officer, and 10 men of the 11th Uhlan Regiment, started on the 11th October 1856, and returned to their native land on the 22nd July 1857, bringing back with them 16 stallions, 50 mares and 14 foals (foaled since their dams were purchased). All these horses are said to have been of the highest blood of the desert. Many were purchased in Damascus and its neighbourhood, and the leader of the expedition, who seems to have been able to conciliate the different Sheiks with whom he came in contact, succeeded in obtaining the friendship of the, at that time notorious Aghil Aga and through his good offices obtained in a comparatively short time many excellent animals. On the approach of the Bedouin tribes to the Syrian frontier, a thing of yearly occurrence with some of them, a visit was paid to the Wuold Ali branch of the Anaese family, said to possess the best horses of the desert. The visit was most successful, and among many others, three mares, said to be of direct descent from the original mares of the Prophet, were bought. One called *Duchma* was purchased from the Sheik himself, and two others, *Dadjanie* and *Huta* were bought from poorer Arabs. I have reason to believe that they afterwards formed part of the Imperial stud of Lippizza, being among 16 mares chosen for that stud on the return of the expedition to Austria. Major Löffler's work gives a great deal of information concerning the breeding of Arab horses, the way they are fed, &c. It is not, perhaps, generally known that camel's milk forms, at times, no inconsiderable item of their bill of fare, especially for mares in foal, or with foals at their side.

Abdel Kader.

Abdel Kader, who was living near Damascus was invited by Colonel Brudermann to inspect his purchases before starting homewards, and took the greatest interest in them, subjecting them in turn to various tests which he asserted would show the purity of their descent; one with regard to necessary breadth of chest may be mentioned, viz., place the two forefeet so that the hoofs are touching, and then measure the width between the knees. Should this be the breadth of two fingers it is sufficient, but if it should measure three fingers the animal must have an excellent chest. At the conclusion he praised in eloquent language the beauty and excellence of the whole lot, adding that it was long since he had enjoyed the sight of so many high class animals and asking how the Colonel had managed to collect so many in such a short time. Of the mares 32 came to Bábolna, and their immediate descendants were among the herds we saw grazing before us. Several of the mares had lately foaled, not many days before my visit. Nearly all of them were grey and seemed to be a little larger than the ordinary run of Arabs. This is explained by the superior quality and greater quantity of food they get in early youth, and there is little doubt but that it is the true explanation, for the Arab mares of Count Julius Dzieduszycki * were small and weedy compared with those in the Government studs, and it is said that they do not get proper nourishment in early youth, a common fault in Galicia.

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* Lieutenant Löffler, now major and commandant of the Imperial stud of Kladrub. To his interesting work entitled "Die Oesterreichische Pferde "Ankaufs Mission unter dem k. k. Obersten von Brudermann in Syrien "Palästina und der Wüste in den Jahren, 1856, 1857," I am indebted for the information concerning the expedition.

Of colts in the stud, there are,—

2-year olds - -	35
Yearlings - -	29
Lately weaned -	34
Of fillies, 3-year olds,	23
„ 2 „	35
„ 1 „	28
Weaned - -	39, and 6 foals with their dams.

There are besides 53 mares of different descriptions, giving a total of 405 in the stud.

MEZÖHEGYES.

History.

The Royal Hungarian Government stud at Mezöhegyes is situated in the county (comitat) of Békéscher, and is distant about 17 miles from Oroszhazá, the nearest village and railway station. The stud was founded in the year 1786 by the Emperor Joseph II., on lands which belonged to the crown, and the revenue of which had hitherto been applied to the maintenance of the Hungarian Noble Guard. On their reduction in number from 120 to 60, they ceased to be so applied, the necessary funds being supplied from other sources. The

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* See account of Horse Show, p. 259.

original object of the stud was to improve the small and insignificant breed of Hungarian horses, to get light cavalry remounts, and to serve as a depôt for those bought up in the Banat and Transylvania. The stud contained at first 800 mares, and after the campaign of 1809–10 the most suitable mares were sent there from the cavalry on its reduction, the total number being then about 10,000 or 12,000. This number was reduced at different times, and in the month of November 1873 there were about 650 brood mares and 40 stallions. In the year 1816 a terrible storm devastated the country, and great losses were caused by it, though it had the good effect of inducing the authorities to plant timber for protection against the wind, &c.

Topography:

It covers a total area of 38,610 acres, and is divided into four sections—I. Mezöhegyes to the west; II. Fetskes to the north; III. Kamarás to the east; and IV. Paregh to the south. The whole district is perfectly flat, and it has not the advantage of having any river in the neighbourhood, and is very much exposed to the wind. It is bounded on all sides by a broad ditch and a belt of acacias, about 40 feet wide. The estate is carefully cultivated, and about 2,174 acres are laid out in plantations, which give it a cheerful appearance, and render it as it were a bright oasis in the dreary plain in which it is situated. Mezöhegyes itself is divided into two parts, the new and the old. In the new portion is the dwelling of the commandant, at present Lieut.-Colonel Horváth von Szalaber, the stables, the hospital, the Roman-Catholic and Protestant churches, the men's barracks, riding school, officer's dwellings, sick horse stables, and hotel, forming quite a little town in itself. In the old portion are the farm buildings, the dwelling of the director of the farm, workshops of every description, bakery and slaughter-houses, as well as sheds for sick cattle and pigs. Cattle and pigs are reared on the estate, and it is the intention to breed sheep as well.

The farm furnishes the stud with every requirement in the way of forage, except oats, a large portion of which has to be bought, the expense being covered by the sale of wheat, which is grown instead, and is more profitable.

Various breeds.

Mezöhegyes differs from the studs of Kisbér and Bábolna in that the stock throughout is *half-bred*, and for that reason it is more interesting than any other Hungarian stud. The breeding scope extends over as many as four different races—the English thorough-bred, the Arab, the Norman, and the Lippizzaner; and these are again subdivided into families, each having its own type, and, as a rule, its own peculiar colour

Families in each breed.

all of them having been formed in the stud itself, and bearing the name of the original sire, who in almost every instance has imprinted his character on his descendants. Of the different families, two are of English blood, viz., the *Furioso* and the *Abugress*, and they date back to the years 1841 and 1842 respectively (*Furioso* was by *Privateer*, and bred by Count Karolyi. He died 25 years ago). Three are of Arab descent—the *Gidran*, *Schagya*, and *Siglavy*, this last family being however almost extinct in Mezöhegyes, though still kept up in Radautz. The Gidrans date from the year 1825 and the *Shagyas* from the year 1837. Of these three families, the first named is chestnut throughout, there being hardly an exception to this rule, the two latter are dark grey becoming rapidly white. The original *Siglavy* was living about the same time as *Gidran* and *Schagya*, and though his progeny were remarkable for their excellent physical qualities, yet his reputation has descended tarnished by his savage disposition, which has to some extent characterised the family which bears his name.* We then have the Norman race of *Nonnius*, divided into two breeds, a large and a smaller. This is a very favourite breed throughout the whole of the Austro-Hungarian Empire, and is interesting in that though dating back as far as 1815, in which year the parent of the race was brought from the government stud of La Rosière in France, yet the qualities of the sire have descended unimpaired or altered through so many generations. No inconsiderable value is attached to this property, for as they are peculiarly adapted to, in the case of the smaller light, and the larger medium draught, it is by no means difficult to find a well-matched pair. The prevailing colour is brown Nonnius died at Mezöhegyes in the year 1838. Then we have the Lippizzaner race, which dates back, as far as Mezöhegyes is concerned, to 1807, and which, though laying claim to being now a distinct race, was originally of Spanish origin, with a strong infusion of Arab blood (*vide* description of Lippizza). Lastly, within 10 years a breed of Norfolk horses has been established by putting stallions of that race to mares of the various breeds indigenous to the stud. There seems to be every prospect of success attending this last family, to judge by the examples already obtained of short-legged mares, well ribbed up, and with excellent loins and shoulders.†

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* See page 289, "Bábolna."

† The mares originally forming the stud were Hungarian crossed with Arab, but for the last 40 years the breeds have become as above described.

Of the 667 mares mentioned above there are—

Number of each family.

Shagyas	69
Gidrans	67
Furioso	72
Abugress	79
*Majestoso** Lippizzaners	38
*Conversano**	75
Nonnius	220
Siglavi	2
Norfolk	45

I stayed two whole days at Mezöhegyes, and though more time would be necessary to make a critical inspection of the mares and their progeny, yet through the kindness of Col. Horváth, who accompanied me himself to each of the various studs which dot the large domain, a very good general idea could be obtained as to whether the principles on which the breeding is carried out were adhered to, and whether the result justified the system adopted. The sires used are as follows: thorough-bred English, of which there are at present four, viz.:—

Thorough bred stallions.

Palestro, by *Fitz Gladiator*, out of *Lady Saddler*.
Macbeth, by *Commotion*, out of *Lady Hereford*.
Jackson, out of *Redpole*, by *Blair Athol*.
Exact, by *Saunterer*, out of *Catastrophe*.

A horse called "*Oranien*" covered for some time as a thorough-bred, but his claims were found to be doubtful on the side of the dam, a *Harkaway* mare. He is by "*The Little Known*."

Pure Arab, of which there are but two now—

Arab stallions.

El Delemy No. 1 (bought in Cairo in 1860 for 460*l*.),
" " 2.

The remainder are of all the families named above, including Norfolk. A venerable *Schagya*, 21 years old, is still used in the stud, and is very well shaped.

Besides the above-named horses now doing duty, it is as well to mention some of those which have contributed to make the stud. Of English thorough-breds the following may be named:—

Chestnut	*Amati*, by	*Womersley.* *Sleight of Hand.*
"	*Chief Justice*, by	*The Hydra.* *Lawyer's Lady.*

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* See Lippizza.

Chestnut	*Deutsche Michel*, by	*Italian.* *Flying Polka.*
„	*Grizzly Boy*, by -	*Sheet Anchor.* *My Mary.*
Bay -	*Revolver* - -	*Melbourne.* *Sally Warfort von Defenie.*
„ -	*The Czar* - -	*Warlike.* *Venture Girl.*

System of breeding adopted.

The half-bred races are freshened by infusion, from time to time, of the blood of the thorough-bred stock they descended from. In cases where it is not deemed advisable to use a thorough-bred sire, one of the same family as the mare is used, for instance, a *Schagya* stallion serves the produce of a thorough-bred horse and a *Schagya* mare, or a *Furioso* stallion serves the produce of a thorough-bred and a *Furioso* mare, but this is by no means an absolute rule to be followed blindly, it depending on the nature of such produce, and in cases where, in the opinion of the commandant, there be sufficient substance, bone, &c., in the produce of the thorough-bred horse and half-bred mare to warrant his doing so, the thorough-bred is again used. The *Nonnius* family are frequently crossed with thorough-breds and give big progeny. This is done as much to correct the very ugly head which is an invariable characteristic of the breed, as for any other reason.

Furiosos and Northstars.

Precaution in breeding.

Smaller Nonnius family.

The first of the outlying stud farms which we visited contained 62 half-bred mares all served by thorough-breds or half-breds, the thorough-breds being put to the most powerful among them. All these mares were either by *Furioso* stallions or by the thorough-bred horse, *Northstar*. *Northstar* died in 1871 at the advanced age of 27 years, much regretted and leaving a numerous and excellent progeny. In general these mares are of the riding-horse stamp, and many of them are admirably adapted for hunters, and some would make good carriage horses. That there should be very few brood mares in the whole stud which would excite adverse criticism appears strange at first, but it is easily accounted for from the fact that of the fillies only those best adapted for serving the purpose of breeding, are kept in the stud, the remainder being sold every year by auction. From 70 to 90 are thus drafted into the stud as four-year olds, and as many more sold at the same age. All the colts go to the military depôts of travelling stallions at the above age, except of course those which for any reason are ill-adapted for stud purposes, and such are sold at the same time as the surplus mares. The second stud contained 89 brood and three year old mares of the smaller *Nonnius* race. All these are bred for light draught purposes, and many useful very even pairs could be selected from them. The ugly *Nonnius* head was however common to all.

We next visited a shed containing 160 yearling fillies of all races, not yet sorted out. The different characteristics of race were sufficiently shown to enable one after a little practice to distinguish one family from another.

The next stud contained 82 brood mares, of which about 40 were by thorough-bred sires, out of *Nonnius* mares, the sire used for the most part being *Revolver*. The remainder were of the larger *Nonnius* breed and adapted for heavy carriage horses and cavalry. The first named will be again put to *Nonnius* stallions. This appeared necessary according to the rules adhered to, as before explained, for though in many instances the cross had succeeded in its object of correcting the shape of the head without deteriorating the bone and substance, yet it was but too often apparent that the head remained as ugly as ever, and a tolerably large frame was united with a most undesirable lightness below the knee. In nearly every such case *Revolver* was found to be the offender, and as regards the head, one's surprise ceased on learning that he had as ugly a one as his sire *Melbourne*, and that he invariably transmitted it to his descendants. Of the 82, 53 were in foal out of 57 which had been covered.

Stud stallions.

The approach of dinner hour compelled us to return to Mezöhegyes, in sufficient time, however, to permit of a stroll through the stables containing the stallions. Of the thorough-breds, "*Jackson*" struck me as being a wonderfully good type of a sire for getting weight-carrying hunters. He was bred at Kladrub, out of *Redpole* by *Blair Athol*, and I afterwards heard the lament of the trainer there, Mr. Jackson, at his having been removed (exchanged) to Mezöhegyes, he being at that time a most promising three-year old. Of the stallions of indigenous race the *Gidran* were the handsomest. **Gidran.** They have lost for the most part their Arab characteristics in the course of time, and only retain the chestnut colour of their ancestor. The *Furioso* and *Abugress* stallions are **Furioso and Abugress.** useful animals with no very strong family characteristics. They are chiefly bays and browns. The *Schagyas* are all **Schagya.** greys becoming rapidly white. The oldest of them mentioned above as 21 years old, is by a Bábolna Arab, *Schagya IV.* out of a Mezöhegyes *Schagya* mare called *Samhan*. He is much disfigured by warts, but is otherwise a well-shaped animal with broad flat legs. The Lippizza stallion is a good type of its useful race, grey in colour. Of the two Arabs, *El Delemy No.* 1 is a very handsome animal, and was exhibited at the **Arabs.** Paris Exhibition in 1867. Both these Arabs are greys. The *Nonnius* stallions, all bays or browns, seemed to cor- **Nonnius.**

respond to the general characteristics of this race, good useful light draught horses, but taking them all through they are more useful than ornamental, though some pairs of handsome carriages horses with good action might be selected from among them.* The Norfolk stallions seemed to be excellent animals. This blood is highly prized, both in Austria and France. Their chief characteristics are cobbiness of shape and excellent action. Prevailing colour, iron grey or roan. We inspected besides the stallions a stable containing 69 three-year old mares of all races which are at present being trained to the saddle.

Norfolks.

In the afternoon we inspected a stud containing 57 half-bred Arab mares, all in foal, and for the most part to pure Arab stallions. All were greys. At the back of the same building were 74 *Gidran* mares, nearly all in foal.

On the following morning we commenced with a stud of 139 two-year-old mares of all races not yet sorted out. We then proceeded to inspect a series of 15 paddocks of about an eighth of an acre each. In each is a large roomy loose box. Their object is to confine young stallions, chiefly two-year olds, which have lost condition. It is generally the bigger colts out of each family that require this care to enable them to put on flesh after having knocked about a little too freely among their companions. We next inspected a lot of 161 yearling colts of all races, and then one of 159 colts of this year's foaling, also of all breeds. The next lot was a mixed one of 153 fillies, not long since weaned. In the afternoon we drove out to a stud farm, where the smaller English half-breds of the *Abugress* family are kept. *Abugress* was an Arab, and the original family were Anglo-Arabs, but they have been bred back to the English race, and have lost nearly all their Arab characteristics. There were 73 brood mares in foal to half-bred English stallions, *Furiosos* and *Northstars.* They are a good useful lot for riding or driving, and my attention was called to many well shaped animals of the hunter type, by my kind conductor. The last stud to be visited contained 83 brood mares, 45 of which were of Norfolk race bred in Mezöhegyes, by "*Pride of England,*" "*Nordstern,*" &c. I could not find out how the latter came by his German name, but his progeny were most excellent. This breed is greatly valued for their trotting, and general sturdiness, and they seemed to be all that could possibly be desired. The remainder were *Nonnius* mares of the larger breed. These latter are made to earn their livelihood by work, as well as bringing foals. Some magnificent van horses might have been chosen from among them.

Norfolks.

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* And here be it observed that they are often rather wanting in thigh.

Value of plenty of fresh air

Treatment.

All the sheds in which the outlying studs are housed are closed on three sides, the southern one being entirely open and communicating with a large yard. Plenty of bedding is laid down, and the mares and foals wander about at liberty in the stud or yard, being tied up only at feed time. The veterinary surgeons maintain that their charges never suffer in the smallest degree through the sheds being open in winter, and that on the contrary there are far fewer cases of eye disease now than was formerly the case when the sheds were closed altogether. All the mares and foals are uncommonly tame, indeed of so sociable a disposition as to interfere seriously with the business of inspecting them. Immediately on entering the shed or yard they invariably crowded round us, nibbling our coats or trying to poke their muzzles into our pockets — highly suggestive of cupboard love. Kinder treatment it is impossible to imagine than that which they received at the hands of their keepers, and they consequently do not know what fear is at the presence of man. Every fourth or sixth week their hoofs are pared (they are none of them shod), and about every three weeks the lower layer of bedding is changed, and the rest well shaken up. There was never so much as a suspicion of a bad odour in shed or stable. It stands to reason that they are not groomed, the few men told off to each stud farm being unequal to the task even if it were desirable, which it is not, the dirt being merely superficially knocked off with a whisp of straw. That great interest must be taken in the stud by the commandant and all his officers is an absolute necessity, and it would be impossible to breed successfully so many families without the most careful study of the qualities of both the mares and stallions, not to mention the experience necessary to enable a fair guess to be made as to the result of any particular attempt at crossing. Colonel Horváth's experience is perhaps as great as that of any man in Austria, and his enthusiastic interest in his duties is patent to the most casual observer. "Ist das nicht ein Jagdpferd wie es im Buch steht?" "Is that not the picture of a hunter?" he would frequently remark, and no one could gainsay him, and the frequency with which this high praise was accorded, proved how well he had known to pair the different elements to produce such a successful result.

New stud to be formed in Transylvania.

The inspection of the actual stud of Mezöhegyes was finished, but a treat awaited me on my return to the head-quarters of the stud, viz., a visit to the brood mares and stallions destined to proceed in the summer of the year 1874 to Transylvania to form a new stud at Fogaras. This nucleus consists of 75 mares and 4 stallions. The mares are chiefly Lippizzaners of the *Conversano* family bred at

Mezöhegyes, but there are also *Majestosos* of the same breed, and a fair proportion of *Schagyas*. All of them are selected for compactness, the smaller ones being preferred. The stallions are all Lippizzaners, and represent the chief families of that excellent breed—*Conversano, Majestoso, Favory* and *Pluto*. The best of them is the first named, standing about 14 hands 2 inches, black in colour, a little wonder for compactness of shape and shortness of leg, and having one of the most beautiful and intelligent heads it is possible to imagine, great breadth of forehead fining down to a small muzzle, and a large soft eye. His disposition corresponds in every way, and he is most gentle on all occasions. Among so many favourites he holds the first place in the affections of all the men. The fact of his having such a rarely beautiful head is the more remarkable that as a rule the Lippizza heads are by no means things of beauty, the Spanish origin showing often very unmistakably in this particular. The other three are fair representatives of their race, and will, it is thought, serve very well the purpose intended in the formation of a breed of small active horses suitable to that mountainous country. I may here mention that in a conversation with one of the gentlemen in the Ministry of Commerce (Handels Ministerium) at Pesth, I was informed that 11,360 acres of land were taken up by government for the stud at Fogaras, which is on the borders of the Wallachian frontier, and that all is now ready for the reception of the horses, though the time of year is unfavourable for the journey, the climate being very rigorous. The move will be made in 1874 in the month of June. It is the intention of the Hungarian Government to buy up as many mares and young colts as they can of the Szèkler race of horses. It is only to be found in 10 or 12 parishes (Gemeinden), and to put them to the stud. It is a remarkably wiry race, and though small, being hardly 14 hands high, and weedy to look at, has great soundness of constitution and endurance. My informant assured me that on a recent visit to Transylvania he had performed a journey of 72 English miles in 18 hours with a pair of most unpromising looking weeds of this breed. The object in buying young colts just weaned instead of full grown animals is to start from the commencement with the best material, great improvement being hoped for from the mere fact of their being properly fed in their early youth, and every chance of developing as far as possible being afforded them. The experiment is very praiseworthy, and will carry the good wishes of all lovers of horses.

Lippizza Stallions.

Szèkler breed.

LIEUT. T. H. ANSTEY, R.E.

CATTLE.

REPORT on the CATTLE* exhibited at the LIVE STOCK SHOW held in connexion with the VIENNA EXHIBITION.

By SECRETÄR SCHÜTZ, Landw Wanderlehrer für Kärnthen. Translated by Lieut. T. H. ANSTEY, R.E., Official Delegate to the International Jury.

THE show of live stock might be regarded as a success notwithstanding the numerous blunders made in the arrangements, blunders felt most keenly by exhibitors, jurors, and the public. With regard to the number of beasts exhibited, and their high quality, it is safe to say that Vienna has never enjoyed the equal of this show.

The international character of the show was maintained by a few animals from England and Italy, and a larger number from Germany, and it is to be regretted that neither France, Switzerland, nor Russia were in any way represented. Austro-Hungary with Transylvania sent a considerable contingent, and from the western provinces only those which were hindered by rinderpest were not represented. Carinthia, so rich in cattle was among them, sad to say, and the 27 head promised remained away. Actually exhibited were—

England	8	head.
Italy	18	„
Germany	102	„
Austria	434	„
„ in exhibition of milch cows	48	„
Hungary	249	„
	859	„

The shorthorns sent by England evidently did not represent the best of their breed, and some of them might be pronounced "middling." They seemed in part to be too long in the leg, in part coarse and too heavily horned, and not bearing a sufficiently uniform stamp.† Many a bull of white

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* The plates illustrating this report are electrotypes of those in the report of Prof. Wrightson for the Royal Agricultural Society, Vol. X., Part 1.

The originals were photographs taken at the live stock show, and furnished to the R. A. Society by the translator of this report.

† Another reporter remarks on the beauty and excellence of the shorthorns shown by England, remarking that Germans and Austrians have yet much to learn in breeding for meat. All our experts considered them very fair specimens. A fat ox, a half-bred shorthorn, with horns curling inwards, and set downwards, exhibited by Archduke Albrecht, obtained the highest commendation from all the English experts, who attended the show.—T. H. A.

Norrisch breed, bred by peasants in the Alps, was superior to some of them both in weight and shape. Besides these more beautiful animals of this breed were shown by Archduke Albrecht and Baron Magnus, of Drehsa in Saxony. The latter has a herd of 50 shorthorns of pure race, but being a judge he had to retire from competition. Also, the provincial society of the principality of Lüneburg exhibited through M. H. Sprengel a fine white shorthorn, though he was a little too leggy.

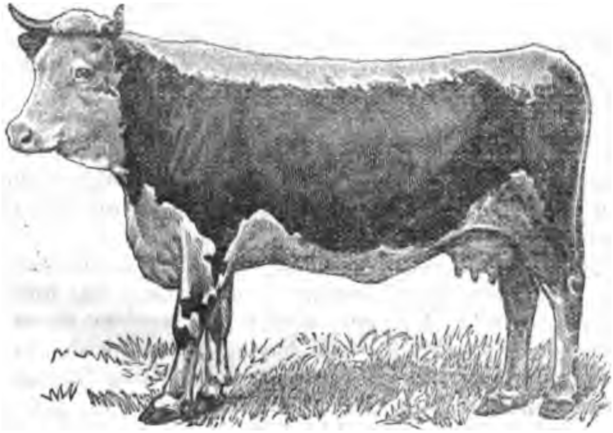
Of crosses between shorthorns and other breeds Archduke Albrecht was at the top of the tree with the animals from his estates of Bellye and Ungar-Altenburg. He showed crosses with Dutch and Bernese cattle. The Keltschan Sugar Company showed the same with Kuhländer, Schwytzer, and Mürzthaler. Both these exhibitors got great credit, but the greatest praise was earned by the 10 head of shorthorn crosses, all fat oxen from the estate of Ungar-Altenburg.

From Italy, the Agricultural Societies of Reggio-Emilia, Pinerolo, Turin, Arezzo, and Foggia sent a total of 18 animals, comprising bulls, cows, calves, and oxen. Most of them were white, some of a brownish-yellow colour, big-boned, long-legged, black-skinned, long-horned, and mostly short and falling off in the hips. The cows seemed ill-kept and can probably lay no great claim to milk producers.

Dutch cattle were plentifully represented from Germany, and Austro-Hungary. The dealers, Brothers Boeckhoff in Bingum, East Friesland, Otto Boeckhoff and Co. in Lupa, Prussia, Angelis and Detmers in Eisenhamm, Oldenburg, Otto Campen in Emden, East Friesland, Gröneveld and Co. in Wilshausen, Leer and A. C. Büst in Bingum, East Friesland, showed a rich collection of this race, partly as Dutch and Oldenburgs, partly as East and West Frieslands, and also as Gröningers.

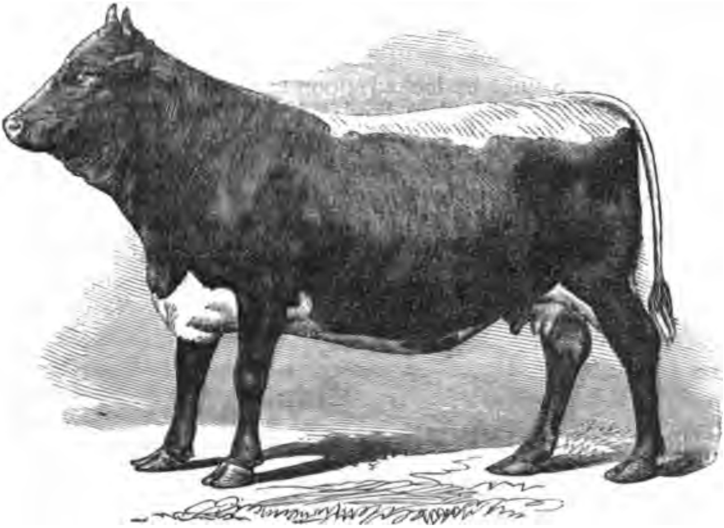
Two Scotch Galloways excited considerable attention through their rarity. They were a bull and heifer, dark brown and hornless, exhibited by Mr. William Müller, Lloyd's agent at Nordenhamm, Oldenburg.

Besides the Dutch cattle sent by Germany, this esteemed breed of milch cows was worthily and numerously represented in the Austro-Hungarian section. It need hardly be said that Archduke Albrecht's representatives from his numerous herds in Silesia, Galicia, and Hungary took a prominent place. Most of the animals of this breed were down in the catalogue as not to be sold. The average yield of milk per cow on the estate of Saybusch was in the year 1872, 885½ gallons. Whether the pure Dutch cattle do as well in Hungary as in Galicia and Silesia has yet to be proved, but the different experiments that have been made on His Imperial Highness's estates in Hungary in crossing Dutch and Swiss and Dutch and shorthorns, not being represented, would tend to the belief that the list of experiments is still regarded as incomplete. Felician Szybalski, of Mników, Cracow, showed a splendid Dutch bull with remarkably deep chest, five years old. Cattle of this breed were also exhibited by Theophil Ritter V. Ostaszevski, of Wzdów in Galicia, Count Adam Potocki, of Krszeszowice near Cracow, the Imp. Teresa fund property Dürnholz, by Prince Schwarzenberg and William Prince of Schaumburg Lippe, of Ratibořic in Bohemia, without mentioning the numerous crosses. Dutch cattle cannot be looked upon as a matter of fashion, as they only thrive in low lands with rich pasture, having particular care lavished on them. Even greater pleasure was felt in inspecting the magnificent beasts of Swiss extraction, exhibited under the various names, Messkircher, Kuhland, Bernese, and Simmenthaler, perhaps the best part of the whole exhibition. It was pleasing to notice the evident attempts of the breeder to improve the breeds in themselves, to refine them, and to increase their milk-giving property. On no previous exhibition have such finely built animals been shown. A lot of 12 deserve especial mention; they were of the Messkirch family, exhibited by the Agricultural Society of Messkirch in the Grand Duchy of Baden, and after them the collective exhibits of the Kuhland, Neutitschein, and Fulnek Societies. The animals shown by Count Larisch Mönnich, of Freistadt in Silesia, and those of Prince Lichtenstein, of Feldsberg, deserve to be classed with these



Kuhland Cow (Moravia), exhibited by the Agricultura Association of Neutitschein.

last. There were some admirable specimens of the Pinzgau breed, so greatly valued not only for their milk-giving properties but on account of their rapid development. They were sent from Salzburg, the Tyrol, and by several large landowners. It was greatly to be regretted that the Möllthalers from Carinthia could not be sent on account of the cattle plague. The best Möllthalers are superior as milch cows to the regular Pinzgauers, though they are of the same family. Among the collective exhibition from Salzburg may be mentioned the animals of Michael Gmachl, of Elixhausen, a cow of Michael Holzer, of Salzburg, and a cow belonging to Josep Hassauer, of Rattenberg, Tyrol, said by the owners to be of pure Tyrol breed.

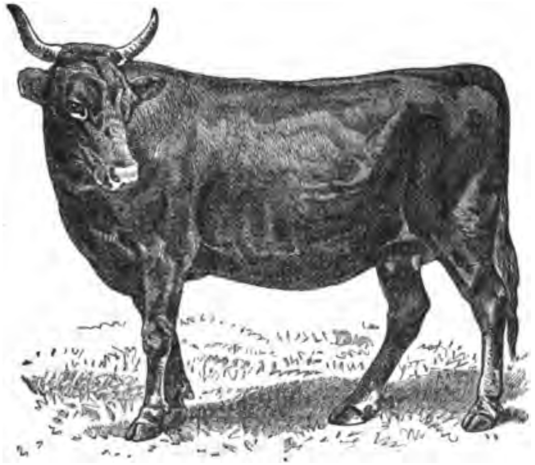


Pinzgau Cow (Salzburg, Tyrol), exhibited by the Royal Imperial Agricultural Society of Salzburg.

It is much to be desired that an end should be put to the chaos of names of so-called breeds existing in the mountains, often called after the valley, and, indeed, merely the village in which they happen to be bred, having little or no real characteristic difference, but being called by a different name from their neighbours, owing to a harmless but misplaced local patriotism. Not only would the outsider be saved a great deal of trouble through having to deal with one race instead of many, but the jealousy as to letting the cattle be crossed with those of the neighbouring valleys, &c. would cease, and thus the in-and-in breeding be avoided through freshening up the blood. There was abundant opportunity to observe the tendency of the rigorous distinctions made between the different breeds, and in how little they were valid as a rule, thus the so-called Schwytzers, are in another instance called Montafuners, and again, Allgäuer. These might come under one head, taking the colours as a guide, and probably the Mürzthaler, Ober Innthaler, Sterzinger, and many others might be brought under the same head.

Schwytzers of excellent quality were exhibited by Prince Schwarzenberg, Count Fries, of Czernahora (Moravia), by Altgraf Salm, of Světla in Bohemia, and by the Agricultural Society of Vienna, the latter showing many original animals bought by the State in the Canton of Glarus. Montafuners were exhibited by the Vorarlberg Agricultural Society, the cattle and pig establishment of the Imperial Agricultural Society of Austria, and by Prince Schwarzenberg. Beautiful Allgäuers of first quality were sent from Archduke Albrecht's domain Ungar-Altenburg, and the Vienna Agricultural Society, Charles Adametz of Möltern, and many others, sent animals of this breed. The so-called Allgäuers, of mouse colour, sent by the Duke of Coburg-Gotha in Lower Austria from his domain of Dürnkrut, have been hitherto known as the Würtemburg breed, and it was probably a mistake in the catalogue.

Among many pleasant sights, one of the most so were four of the ancient race of Egerlanders from Bohemia. This beautiful breed, with their small heads and dark red colours, have had their home in Bohemia since time immemorial, and



Egerland Cow (Bohemia), exhibited by A. E. Ritter von Komers, of Domain Mostau.

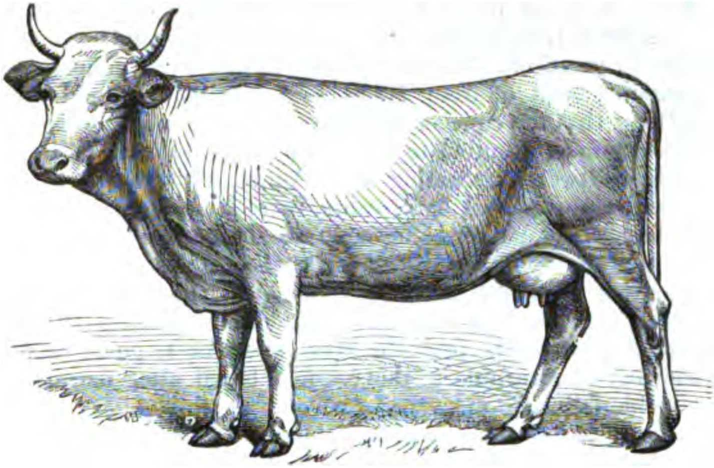
the exhibitor, Ritter von Komers, deserves universal thanks in having given this interesting family an asylum on his estate of Mostau. From running the risk of becoming extinct, they have increased and improved in a series of years under his fostering care. They consisted of a bull and three heifers. It is to be regretted that a yoke of oxen of this breed with harness polished up was not exhibited. It would have shown those who sneer at the breed how disproportionately larger they become than the cows, and their splendid horns would have been much admired.

Mention may here be made of the reddish yellow cattle from Franconia, put down as of Scheinfeld breed, exhibited by John George Kämpf, of Fridau in Lower Austria, and Prince Schwarzenberg.

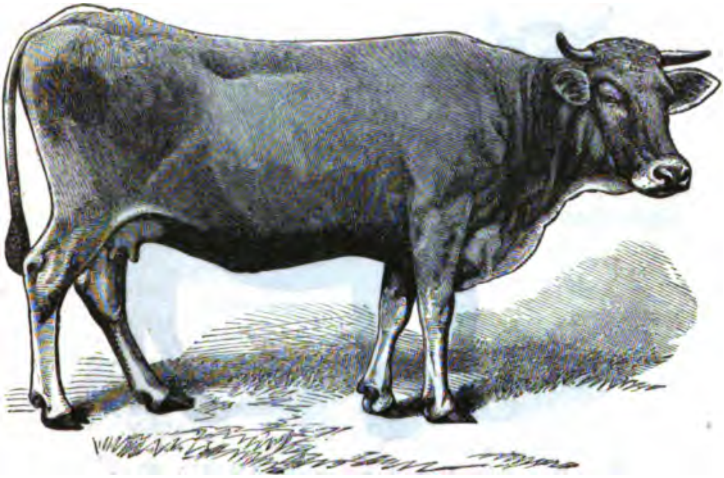
An imposing collection was sent by the Exhibition Commission of Loeben in Styria. It consisted of 84 animals of Mürzthal, Murboden, and the so-called piebald mountain breeds. They were of excellent quality, and the credit of getting so many interesting animals together is due to Count Vetter, of the Lilie, who took all the trouble on his own shoulders, and spared neither time nor money. The value of this collection is enhanced from the fact that all these cattle are bred by the peasants and small farmers, thus enabling the observer to draw conclusions as to the progress made by them in breeding, and it is evident that great strides have been made in the last few years. Among others, the Mürzthalers have been quite regenerated, and saved from the danger threatened them a few years ago of becoming extinct. The handsomest animals of this breed were shown by Count Ferdinand Vetter, of Graschnitz, Franz Rachoy in Loeben, Adalbert Bernauer in Bruck, Joseph Krendl in Wildon, &c.

The white Norrisch race, known in Styria as the Mariahofer beed, were admirably represented, especially by the Benedictine Monastery of St. Lambrecht, and Ferdinand Lang in Neumarkt. The former has special claims to gratitude, for ennobling the breed in itself, instead of following the mania for bringing lowland cattle into the mountains, and ruining the local breeds for many years.

Of these breeds the Mariahofer and Mürzthaler are the best. The Murbodeners are lacking in character, and the piebald mountain cattle, though undoubtedly good milkers, are too small to compete for a first place. From both Mürzthaler and Mariahofer breeds excellent fat oxen can be obtained. They are distinguished by their small horns, small well-bred head, bright eye, handsome neck, straight back, broad hips, great depth of barrel, and short legs and fine skin. The Mürzthalers have the advantage over the Mariahofers, in



Mariahof Cow (Styria), exhibited by Robert Freiherr von Walterskirchen.



Mürzthal Cow (Styria), exhibited by Geysa Ritter von Wachtler.

having smaller horns, and being lighter in bone, but the latter are more powerfully developed. With regard to early development, which the friends of the shorthorns, and the milking properties, which the admirers of the Dutch cattle, throw in the teeth of the breeders of the hardy Styrian and Alpine races, there is no doubt that the highly bred pampered shorthorn and the weak-lunged Dutch would soon lose their types of excellence under circumstances of soil and climate, where the Alpine breed would flourish. That oxen of the white Norrisch breed fed on hay and straw only attain to a weight of 1,852 pounds before getting their second teeth, and that 2½ years' old Möllthaler bulls have a live weight in the peasant's stall of from 1,730 to 1,850 pounds, and after calving, that the cows of this breed give, as nothing out of the common, from 4½ to 5½ gallons of good rich milk, are facts well worth reflecting on. Again, with regard to so-called improvements by crossing, there is nothing surprising in large landowners being able to show excellent results, having an intelligent breeder at their sides, and all the resources of wealth at their command, where the peasant would spoil his own original breed without getting the expected good results from the cross, and who is going to pay the cost of returning to the original breed after more than possible failure?

To return to the animals exhibited, Mr. Johann Sessler of Sachenfeld, near Knittenfeld, showed some good animals of Murboden breed. Marie v. Kleyle distinguished herself with her half-bred Mürzthalers, and Johann Sandbauer in Lower Austria, at St. Martin, near Weitra, managed to produce from the rigorous district of forest and mountain two Mariahofer bulls 2½ years old, which might be reckoned among the handsomest animals in the whole show. If it be permitted to cast a last glance over the collection of animals sent from Styria, it is evident that in such a large collection, brought together from all parts of the country, the uniformity is wanting which characterises the lots sent by the large

Montafuner Cow (Vorarlberg), exhibited by J. A. Ritter von Tschavoll, of Feldkirch.

landowners. The peasant, at least in Styria, does not know how to prepare his cattle for show, either by feeding or grooming, and consequently the roundness of form that distinguishes their more aristocratically-bred relatives is wanting, and the judge is often biassed thereby.

In order to shine at a show the exhibitor must go in for a certain amount of routine, and this has been brought to perfection by the agents of Prince Schwarzenberg in his brilliant collective exhibition, which contrasts strongly in this respect with the Styrian one opposite to it. Nothing is more grateful to the sight than a collection of two-year-old bulls and heifers, and occasionally older heifers in calf, from the same sire, and from earliest youth fed and tended with equal care. When regularly got up to please at an exhibition such a lot defies competition with the peasant's cow.

Prince Schwarzenberg sent from each of his numerous Bohemian estates a young bull and two heifers of every breed reared by him, and many fat oxen besides.

They were as follows:—

From the domain	Libějitz	3	Mariahofers of pure race.
"	Krummau	1	Pinzgauer "
"	Nettolitz	3	"
"	Postelberg	3	Montafuner.
"	"	3	Allgäuer.
" "	Wittingau & Libějitz	3	Schwytzers.
"	Krummau	3	Bernese, red and white.
"	Postelberg	3	" "
"	Neuschloss	3	" "
"	Lobositz	3	" "
"	Leneschitz	3	" black and white.
"	Postelberger	3	Schwarzenberg - Scheinfelder.
"	"	3	Dutch, pure blood.
"	"	3	Bernese, half-breds.

Together, bulls and heifers, 40 head, besides young draught and fat oxen and a fat heifer, together 7 head.

The collective exhibition of Archduke Albrecht, of which mention has already been made, was of a less imposing character in a great measure, because they were more scattered about.

The Duke of Saxe Coburg-Gotha sent, besides his mouse-coloured Allgäuers from Dürnkrut (eight head), nine head of Bernese, of pure breed, and half-breds from Ebenthal, and seven Bernese from the domain of Walterskirchen. With regard to these last, it may be mentioned that they have a too strongly developed bony frame to compare favourably with those exhibited at former shows. After mentioning the beautiful Bernese shown by Count Charles Althann of Swojschitz, in Bohemia, and those of Prince Liechtenstein, of Feldsberg, in Lower Austria, we have concluded with those large landowners whose exhibits are especially noteworthy.

It yet remains to mention the fat and draught oxen. It was difficult to criticise these animals, because they were all so mixed up over the show. Alongside of the prominent lot of 12 shorthorn crosses shown by Archduke Albrecht, and which attracted general admiration, were six head shown by the well known butcher Neumayr, of Vienna, in which he had outdone himself in preparing them for the butcher. They were throughout crosses of Hungarian and Alpine cattle, and the living weight of one pair was 5,555 lbs., the next 5,741 lbs., and the third 5,800 lbs.

Baron von Sina of Rossitz, in Moravia, had two splendid thorough-bred Hungarian oxen, quite ready for the butcher. The Kuffner Sugar Factory of Lundenburg sent a collection of eight fat oxen of Schwyzer, Bernese, Styrian, Moravian, and country cattle. An ox of Mr. Anton Wachsmuth, of Göding, in Moravia, though not yet quite finished in preparation, found favour. He was well fleshed and weighed 3,457 lbs.

Emanuel Ritter von Proskowetz sent from his domain of Kwassitz, in Moravia, four powerful draught oxen, and four fat oxen of his own breeding. They belonged to a German country breed, and were as worthy of attention as Baron Romaszkan's powerful Podolian draught oxen. The latter is doing his utmost to improve this breed.

It would be doing the Podolian-Hungarian breed an injustice not to mention their valuable qualities, which render them so useful in the wide stretching plains which constitute their home. Claiming the minimum amount of attention and care, the Hungarian ox thrives on the scanty provender of land which has often to suffer from long droughts; of slow development, it becomes the best and most durable draught ox in the world, remaining useful throughout a long series of years, to be sent at last to slaughter, and even in this last stage pleasing equally the farmer, the butcher, and the consumer.* What the Hungarian ox has cost in the

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* The reporter's enthusiasm on the subject of these cattle is justifiable to a certain extent. I have seen a pair of them trotting along the road attached to an empty wagon at a fair pace even for a pair of horses, and their endurance was highly praised by Colonel Horváth vor Szalabér, the Commandant of the Royal Hungarian stud of Mezöhegyes, on the occasion of my visit, he having

Podolian Cow (Galicia), exhibited by Baron Jacob von Romaszkan, of Horodenka.

first four years of his career, for he is only fully useful in the fourth year, he richly repays before being worked out, and experience has shown that there is hardly a breed of horses in the world that can compete with the Hungarian ox as a means to agriculture. The cows live in company with the bulls summer and winter in the open, getting scanty cover only during the severest portion of the winter. They are under the charge of a mounted herdsman called a Gulyâs.* The calves remain with the mother as long as she permits. They are never milked, and as milch cows are altogether useless. The young ox is broken in in his fourth year, the bulls and cows never lose their golden freedom.

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abundant opportunity of knowing, for as many as 1,400 cattle graze on the estate, out of which 871 are draught oxen. In this respect they are far superior to the buffalos, these latter requiring large supplies of water, and during the summer drought they will lie down and refuse to proceed long before the Hungarian ox commences to show any signs of fatigue. With regard, however, to the satisfaction experienced by the "consumer," it must be first considered of what nationality he be, as there is no question but that an Englishman would pronounce the best of this meat to be of very poor quality. —T. H. A.

* This is a mistake. The *Gulyás* who attends to the cattle is never mounted. I know this for a fact. The Hungarian cattle have a rooted aversion to the horse, and but a short time before my visit to the estate of Mezőhegyes a horse had met his death at the long horns of one of the animals of the large herds raised there. The mistake is easily accounted for. At the show there were a number of picturesquely dressed *Gulyás* attached to the pen of Hungarian cattle, and among them was a very handsome fellow with horse complete. This was a Czikos, or horse keeper.—T. H. A.

It was then no matter of astonishment that a heifer required six strong men to bring her to the railway truck, and even then this untamed daughter of Pussta broke away and rushed headlong back to the yard. A gulya or yard consisting of three bulls, twelve cows and their calves, a hay-waggon with its span of four oxen, the saddled horse of the Gulyás,* and two dogs were sent by the Agricultural Company of Kapuvár; and the royal stud farm of Mezöhegyes, as well as Count Wenkheim of O-Kegyos, exhibited cows, calves, and bulls in gulyas, in which they could wander at their ease. Of the Hungarian breed, many varieties are to be distinguished, but (says the writer) I am too little acquainted with them to explain wherein they differ. There were three varieties exhibited, the Almásy, Csáky, and Sennyej breeds. John Simor, Primate of Hungary, sent a remarkable bull of blueish grey colour, with black rings round his eyes, and the Duke of Saxe Coburg-Gotha's four deep-chested powerfully built bulls from his Pusstá of Bacs attracted great attention.

Alexander Count Béthlen, of Transylvania, showed the small cattle of the Transylvanian Alps, weighing hardly 617 lbs. They are in other respects closely allied to the Hungarian breed. He and Mr. John Paget, of Gyéres, near Torda (Transylvania), exhibited some Ayrshires, and the latter crosses of Ayrshires with Tyrolese.

The excellent fattening properties possessed by the Hungarian cattle* were shown in numerous instances of oxen in preparation for slaughter.

A good deal of interest was taken in the buffalos from their peculiar smell as well as shape, and two white cows were shown by Joseph Schunster, of Hermannstadt, whose red skin looked through the scanty covering of hair, very much like that of the fat Yorkshire pig. Count Emerick Mike sent a span of black buffalo oxen, and the Royal Hungarian Agricultural Establishment at Kersthely sent a herd consisting of a bull, bull calf, three cows, a heifer, and two oxen destined for slaughter. They all seemed well cared for, and the oxen were very fat. The cows are remarkable for their

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* The following properties spoken of by this reporter are much exaggerated. While inspecting the so-called fat oxen of this breed, I was fortunate enough to be accompanied by a Hungarian friend well up in all the qualities peculiar to the cattle reared on the Pusstás of his native land, and at the same time well acquainted with our shorthorns; and, doubtless, noticing a look of surprise, and perhaps incredulity, at comparing the statement in the catalogue that the long-legged bony animal before us was prepared for the butcher; he remarked, with a smile, that "All the food consumed by the shorthorns went "to make flesh, whereas in the Hungarian cattle it all seemed to go into the "*head and horns.*"—T. H. A.

European Buffalo.

From Geoffroy St. Hilaire et Cuvier's Histoire Naturelle des Mammifères.

breadth of hip (crux), which is a peculiarity of the buffalo. Another small lot of Count Festętics were not so clean, and especially in the matter of the calves did not look anything like so well as the last.

LIEUT. T. H. ANSTEY, R.E.

SHEEP.

The following **Report** on the **Sheep** at the **International Live Stock Show**, held in connexion with the **Vienna Exhibition**, is by **Prof. Dr. G. Wilhelm**, and translated by **Lieut. T. H. Anstey**, R.E., Official Delegate to the International Jury.

There have rarely been seen such a number of different races of wool-bearing animals collected together in one place, as on the occasion of the live stock show in connexion with the Exhibition. The number, as shown by the catalogue, was 1,481 and 135 exhibitors, and these numbers were nearly correct, for though some few had failed to come, yet others, like M. Bailleau, who showed French merinos, and Baron Moritz von Wodianer, who exhibited merinos, were not down in the catalogue. From England there were 10 exhibitors, with 135 sheep. From France four, with 149 sheep. Italy contributed six exhibitors with 22 sheep. The German Empire 44, with 377 sheep; and Austro-Hungary 71, with 898 sheep. The arrangements did not give general satisfaction, though the four tents which bounded the show-ground to the north-west were better than those on the north-east, where the pens were too small and the passages nothing like wide enough. Commencing the inspection from the west the first countries met with were England and France; then followed Italy and Germany, whose pens turned the north-west corner. Austria followed, and finished up with Hungary towards the south. The sheep bred in Europe are divided into four families, viz.: Ovis Brachyura, Ovis Strepsiceros, Ovis Aries,* and Ovis Catotis, or lop-eared sheep. The first of these, the short-tailed sheep, were represented only by six sheep from the Lüneburg Moors, small well-shaped animals with horns and dark heads, good eyes, and a silver-grey wool consisting of long grey and blackish outer hair, with fine undergrowth. They have been well fed and cared for, and are a capital breed for their heather country, though they are decreasing with the march of agricultural improvement. They are exhibited by Mr. H. Sprenger, of Schillerslage, near Burgsdorf, in the province of Hanover. The interesting short-tailed race of the British Isles, dun and black-faced breeds, were not represented at the show at all.*

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* The sheep bred in Europe are all of the family 'Ovis Aries;' short-tailed, wool bearing sheep (except through mutilation at the hands of the shepherd) do not exist. The so-called wild (hairy) sheep, (Mouflon, &c.) are indeed short-tailed, but it is unlikely that our cultivated sheep descended from that stock, there being no record of any animal's tail lengthening through domestication.—T. H. A.

It was not surprising that the group of strepsiceros, Zackel sheep was strongly represented, there being 60 of pure breed and 30 crossings belonging to the different branches of the family. Next to the strong coarse woolled sheep of the mountains of Transylvania, we find the comparatively fine-wooled Zigaja or Cigarea sheep from the flock of Count Emerich Miko, of Klausenburg, and from the entirely black Zackels of the Szekler breed, and the white woolled with black heads and legs, the eye wanders to animals that are perfectly white. Alongside of rams with long horns growing upwards or curling outwards, the hornless Zackel of Galicia is observed. There is no doubt that the present tendency to breed sheep for the sake of the meat has called attention to this family, which has long been noted for its milk-giving qualities and excellent flavoured meat, besides being a hardy race content with scanty herbage. The best proof of the Zackel sheep being capital material to breed from, is shown by the beautifully-shaped heavy-fleeced animals exhibited by Baron von Romaszkan of Horodenka in Galicia. Wethers of this breed attain a live weight of from 180 to 210 lbs., with from 5 to 15 lbs. unwashed fleece, which sells in its unwashed state for 35 to 37 florins per 100 lbs. The ewes are hired for the use of their milk for from 3 to 3½ florins. The lambs have a beautiful curly wool, which makes the lamb skins much prized. As a successful example of improvement by in-breeding the sheep of Baron von Romaszkan were awarded a Hamburg prize.† In Transylvania attempts have been made to improve the breed by crossing with Lincolns. The first Lincolns were brought to Transylvania for this purpose about 10 years ago, and the results are shown by numerous examples from the flocks of Daniel Baron v. Bánffy, Emerich Count Miko, Ladislaus Tiska, &c.

The improvement in shape, wool, and refinement of bone were evident. The jury awarded a Hamburg prize to Mr. John Paget, of Gyéres, near Torda, who first introduced the cross. The Zackel sheep from the Carpathians was also used in promoting the Keltschan breed, esteemed for their meat. The family of Ovis Aries was more numerously represented than any other, as might have been expected, as the merinos, more largely reared in Germany and Austria than any other breed, belong to it. The actual country sheep,* in the strict sense of the word, was only represented by Röhn and Franconia sheep. Both were well made medium sized black faced animals with white combing wool, and they are an excellent material to improve on either by in breeding, or by crossing with English sheep especially Southdowns. It is a pity that no examples of that cross were at this show, as has been the case at others; there were, however, five examples of Southdowns crossed with Silesian country sheep, Merino-Mestizen (Birki sheep), and Galician country sheep, from Archduke Albrecht's estates, Teschen and Saybusch. The Merino-mestis of south-west Germany, the so called "bastard sheep" (Bastard Schaf), so excellent of their kind were not represented.

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* There are none such in existence in the British Isles.—T. H. A.

† Only animals from the Austro-Hungarian empire were allowed to compete for this prize.

Of the different branches of the merino breed there were about 1,000 representatives, showing the various objects sought to be obtained in breeding. They were distinguished in the catalogue by the usual names Electoral, Electoral-Negretti, Negretti, &c., but one would be wrong to take these as representatives of their class, for they refer to the originals bred from, in many instances, and not to the present character of sheep. As a rule two breeds only are to be distinguished, viz., the breeds for clothing wool, and combing wool. It is true that in both there are various shades according to the various degrees of perfection aimed at by the breeder, whether their utilisation for food has been more or less considered, &c., but the distinctions laid down 50 years ago between Electorals and Negrettis have gradually ceased to exist. Among the so-called Electoral flocks carefully bred, we seek in vain for the spindle-legged, flat-ribbed, bald headed, ill-conditioned animals, with extremely fine super-electa wool formerly called Electorals. The very greasy Nigrettis from which many years ago the acme of what a sheep ought to be was sought for, are now only to be found at rare intervals. The clothing wool merino of the present day is well and strongly built with a head of medium length and tolerably broad with short fleshy neck, broad withers and hips, straight back, rounded body, and with well bred feet well put on (gut gestellt). The wool is on an average from Elekta up to fineness of first grade (prima feinheit), is soft, moderately long, with moderate amount of grease; they are dense-woolled animals, and splendidly shaped, particularly in respect to the belly, and both head and feet are well covered with wool. The average is a good one. The exaggerated fondness for creases in the skin has also disappeared.

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* Landschaf.

Most of the clothing wool merinos exhibited from Germany, Austria, and Hungary correspond to the above type of excellence whether descended from pure Electorals or Negrettis, or from a cross, in this instance bearing rightly the name of Electoral-Negrettis. To describe each of the animals would go beyond the limit of a report, and it is enough to say that those exhibited from the above countries are excellent of their sort.

Compared with former exhibitions the tendency towards breeding for weight was very evident, and the enthusiasts for very fine super-electa have room for complaint. Their complaints are unjustifiable, however, for the breeder must be looked on as a merchant, and he must deliver wares in conformity to the demand in the market if he do not wish to be a loser. If the public no longer desire the superfine cloths which 50 years ago were so sought after for their beauty and durability, it does not do to blame the maker who ceases to produce them and follows the present fashion. It is not to be feared that the cherished "golden fleece," the highest class of wool, will be lost, never to be recovered should the fashion change. The whole development of the merino breed has shown what a plastic material it is in the hands of a breeder, and should it become desirable to go back to the former fineness, breeders will be easily able to do it, and, it is to be hoped without losing the advantages they have already gained. The exhibition proves, however, that there are plenty of flocks with extremely fine wool. As examples, may be mentioned the Hennersdorf (Baron Albert von Klein), the Liptin (Alfred von Rudzinsky Rudno), Skalitz (Count Henry Dann), Dronowitz (Baron John von Mundy), Freistadt (Count John Larisch-Mönnich). Then the Hungarian flocks of Hermény (Count Emerich Hunyadi), Stampfen, formerly in Surány Paty (Count Alois Karoly), Sarndorf (Countess Laura Henckel), and Gutor (Doctor Adalbert Czilchert).

The following flocks were especially remarkable for clothing wool, size, and build. From Saxony, Thal near Oschatz (Robert Gadegast), Leutewitz, near Meissen (Henry Adolph Steiger), and Gross Böla, near Luppa-Dahlen (Henry Müller).

From Prussia, Silberkopf (Baron Friederich von Eickstedt), Karlsdorf (Rudolph Meus), Ober Glogau (Count Edward Oppersdorf), Deutsch Krawarn (William von Fontaine), and many other Silesian flocks; Culen, in Prussia (G. von Wiedebach), Nitsche, in Poland (Robert Lehmann), &c. From Austria may be particularly mentioned Gross Herrlitz (Count Franz Bellegarde), Perutz, Count Frederick Thun-

Hohenstein, Prince Schwarzenberg's flocks, in Postelberg (of Leutewitz extraction), Frauenberg (of Hoschstizer extraction), and Libiegitz (of Sehnschilzer extraction). The last named exhibited a lot of 36 ewes, specimens of peculiar beauty. Kolleschowitz (Count Charles Wallis-Weitersfeld) in Lower Austria (Prince Kehvenhüller-Metsch), Kirchschlag in Lower Austria (Theodor Freyler), Cernahora (Count August Fries of Dannek) and Kwassitz (Countess Leopoldine Thun).

In the Hungarian section, besides those already mentioned, the following were noteworthy: Kapuvár (Agricola Company), Martonvásár (Count Geiza Brunswick), Erd and Ércsi (Baron von Suia), and the lot belonging to Prince Augustus of Sachsen-Coburg-Gotha.

The breed of combing wool merinos has always had its home in France, and some remarkable lots, though few in number, were sent thence to the Exhibition. The first place is held by the national sheep-farms of Rambouillet and La Pommeraye. The former which consisted, at the end of the year 1872, of 1,084 animals (14 stud rams, 453 stud ewes, 137 yearling rams, 163 yearling ewes, 160 ram lambs and 157 ewe lambs), exhibited several rams and ewes of their breed, so celebrated for size and beauty as well as richness in wool, and the excellent character of the same, while La Pommeraye showed a ram and several ewes of the well-known Mauchamp breed, with beautiful silky wool, and some animals crossed with Rambouillets, having very good combing wool. The so-called French merinos exhibited by Levebre, of St. Escobille, Bailleau of Illiers, Gilbert of Wideville, and Barin in Epensival, were superior to the Rambouillets in point of size. Gilbert especially showed colossal rams, for which the respectable price of 3,000 florins was asked; in respect to wool, however, they were, in spite of their splendid size, behind the Rambouillets; for there was much to be wished for in density and character. In the German section there were representatives of various flocks, originating from French merinos, among them may be mentioned: Buchholz, near Reetz (Ludwig Schröder); Narkau, near Dirschau (R. Heine); Haubitz, near Grimma (Karl Hugo Kayser); Grüben (Count Walewski); Lappenhagen (Ferdinand Schwartz); Hungerstorf (Friedrich Wilhelm Zickermann); which hardly came up to the parent stock in point of size, but surpassed them for the most part in point of quality of the wool. The weight of fleece of washed wool reaches as much as 8 lbs., which has as a rule the character of a well-bred combing wool, but which can be used as clothing wool sometimes, as for instance, in the case of the Kayser flock, which was remarkable for unusual density of staple. Besides these German flocks of later origin, there were representatives of the German combing-wool sheep, bred long ago, in the lots from Saatel (R. Holz), Koppelow (C. von Lewekow), and Medow (H. Steffen), in Germany, and Ratiboritz in Austria (Prince Wilhelm Schaumburg Lippe), of which the last-named is an offshoot of the well known Boldebuck flock, which was formed in 1814 by the purchase of a number of animals direct from the (Cavagne) flock of the Duke of Infantado, at Terrier, in Issy. These combing-wool sheep are behind the French merinos in point of size, but the quality of the wool is superior.

Passing to the English breeds, the sheep bred for their meat, the Southdowns, 100 in number, may be first mentioned, as the most important results have been obtained from them by the German and Austrian farmers. England sent specimens of the first flocks of this breed from Merton Hall (Lord Walsingham), Elmham (Lord Sondes), each represented by 20 magnificent animals, which found favour among all.

The German Southdowns were not so numerous, though the excellent animals from the sheep farm of Canena (G. Stahlschmidt), were not in any respect inferior to their English relatives. Good specimens were also sent from Drehsa (Baron v. Magnus), Seschivitz (F. Steide), and Priebarn (G. v. Schörnsmark).

Austria was represented from Waleczow (Franz Altgraf v. Salm-Reifferscheid), by most excellent breeding material of Southdown race, principally animals imported from England, and those from Peruc (Count Friedrich Thun Hohenstein), Cernahora (Count Augustus Fries), and Kunstadt (Baron Kund von Hourichs), were not behind hand.

England sent, beside Southdowns, Shropshire downs from the flocks of Lord Chesham and Mr. Thomas Fulcher of Elmham, most beautiful animals, especially the former; and Germany was represented in the same breed by animals from the flock of Ernest Böttcher of Gross Lafferde. The mean weight of washed fleece of the latter is 6 lbs., and one of the rams weighed 280 lbs. M. A. W. Brauer, of Skludzewo, also showed some excellent animals of the same breed, with fine bright wool (weight of a sheep, 221 to 237 lbs.). Robert and John Russell, of Horton Kirby sent some improved Hampshire downs, of beautiful shape, and some fine long woolled rams (improved Kents). Among the remaining long-woolled sheep, the splendid animals shown by Mr. Swanwick Russell, from the Agricultural College

Farm at Cirencester, and the Lincolns of William and Henry Dudding, of Penton House, deserve especial mention.

The crosses with English breeds, with the exception of the Lincoln-zackel sheep already mentioned, were all exhibited in the Austrian section. There were about 100 head in all, half Southdown crosses. Southdown merinos were exhibited by the Keltschaner sugar factory, from the Teschen estate of Archduke Albrecht, and from Peruc, the domain of Count Thun. The cross is obtained in these two last instances by putting the older ewes to Southdown rams before they are drafted, and the animals from this cross are fattened for market at 11 months old. The crossings of Southdowns with Silesian and Galician country sheep, exhibited from the estates of Archduke Albrecht, were mentioned above. The Southdown-Paduan sheep, from the flock of Count Augustus Fries, in Cernahora, were very interesting animals—they were chiefly remarkable for their beautiful combing wool. The Cotswold merinos of the same exhibitors were also worthy of notice. The Keltschaner Sugar Factory Company exhibited, besides the Southdown merinos already mentioned, some Cotswold merinos, and some which they call the Keltschan breed, bred for its flesh. This breed has been established by putting Cotswold rams to ewes of large size, partly merinos, partly big country sheep, from the Carpathians, and is kept up principally on the estate attached to the factory. 340 Cotswold merinos, 470 Southdown merinos, and 500 animals of the Keltschan breed, are kept on their farms. The Cotswold merino wethers attain, with 12 to 14 months' age, to 110 to 120 lbs. Those of Keltschan breed to 140 lbs.

The group of lop-eared sheep were represented by some animals sent from Italy, particularly several Bergamask sheep which were remarkable for their size. A sheep sent from Vicenza was particularly noticeable for its curly wool, and it is probably a cross with a lop-eared and merino or short-woolled country sheep.

In conclusion, on glancing over the whole show, it strikes one that the sheep are being bred more and more for their meat, and this is to be explained by the formidable competition in wool growing in the antipodes. The methods adapted to this end are various. Nothing would be more foolish than to recommend the same proceeding to all, and to agree without effort at criticism in the cry "Away with the wool-sheep." Many breeders hold to their fine-woolled merinos, but try to improve their shape, in order at the same time to increase the quantity of wool and meat. Amongst other lots there was a merino wether from Baron v. Sina's estate at Rossitz, weighing 170 lbs., the heaviest of the lot. Others will be able to make their flocks pay well by breeding for breeding purposes, for valuable stud animals will always be eagerly sought after for foreign exportation to freshen up the blood which may have deteriorated on foreign soil through climatic influences.* Where the pasture for the sheep is rich and plentiful, large combing-wool sheep, French merinos, and English sheep and their crossings will best be reared. On large domains, with various conditions of soil, wool-sheep could be reared on the higher farms with lighter soil, while the sheep bred more for meat, could thrive the lower heavier lands. The question of wool can, however, never be disregarded for the sake of the meat, as the yield of wool can be increased so considerably by proper choice of breeding animals. Experiments will always have to be made in breeding, for absolute laws cannot be laid down, and what has succeeded well in one place may fail in another.

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* This cannot always be counted on. Fortunately some small samples of wool were sent to me just before the live stock show. They were taken from sheep bred in the western districts of Victoria, in Australia, and were barely of 12 months growth. The fineness was admitted as being equal to almost anything in the show, but the greater length of staple caused unbelief in the age of the samples. One of the most celebrated breeders in Germany, Mr. Henry Steiger, supported me in declaring that it was not impossible, as he knew the sheep did improve, but his shepherd remained incredulous, maintaining that it was of at least 15 months growth. From subsequent inquiry I have ascertained that for over 30 years no fresh blood had been introduced into the flock from which the samples were taken, nor would the breeders permit on any consideration.—T. H. A.

Lieut. T. H. ANSTEY, R.E.

PIGS.

The following REPORT on the PIGS exhibited at the INTERNATIONAL LIVE STOCK SHOW, held in connexion with the VIENNA EXHIBITION, is by M. KEMPER, and is translated by LIEUT. ANSTEY, R.E.

The 200 pigs exhibited, although not as numerous as was hoped for from the entries, were most interesting and instructive examples of the different races. The general tendency of the breeding was very clearly shown, and it was gratifying to find that Austria was not behind hand in improving and ennobling her breeds. With the exception of the indigenous race shown by Hungary, the English pig in its different forms, colours, and names, was chiefly represented. Everywhere these breeds have been introduced, and have made themselves thoroughly appreciated. The method adopted of late to distinguish the different breeds of the numerous English races in black and white, and again in large, medium, and small, deserved the greater attention from its simplicity. The black pigs were represented only by Berkshires; the white by Yorkshires, Suffolks, Windsors, and Lincolns, the latter being Mr. Duckering's pigs crossed and improved by Suffolks and Yorkshires. The firm of Schütt and Ahrens, in Stettin, exhibited a considerable number of animals of Mr. Duckering's breed. They belonged to the large and mediums, were throughout white in colour, and of beautiful shape, with but little hair and fine reddish skin. The head, which in all the animals exhibited was small and well bred, might almost be called over-bred in some of the older animals. Too small a head with the snout bent upwards renders feeding a matter of difficulty, and does not meet the requirements and views of German breeders. The two-year old animals were of considerable weight, 600 lbs. and upwards. They showed magnificent keeping and feeding and were, according to the exhibitors, used at the same time for breeding purposes, and the sows were said to be with young. It is, however, a risky matter to buy expensive animals under these circumstances at exhibitions, the result often not by any means corresponding to the hopes of the buyer. For this reason the larger and older animals were not easily sold, but the younger and smaller ones found a ready sale at high prices; three months old at 90 florins to 100 florins; six months at 150 florins, and young sows said to be with young at seven months old, went for from 180 florins to 200 florins. Their rivals in the next pens were the large Berkshire, of Mr. Swanwick Russell's well-known breed, without doubt the most beautiful animals of this race in the whole show; broad and lengthy with well shaped heads, most highly bred, and a very level lot, all exactly alike. The two-year old boar of Mr. Swanwick Russell's, not for sale, was the finest animal it was possible to see anywhere. The sale was a matter of difficulty through the high prices asked, but all of them were eventually bought by the well-known breeder Baron v. Magnus of Drehsa. From England itself Mr. Fowler, of Kersley Manor, was the only other exhibitor. He showed some examples of the small Berkshire and Windsor breeds. All the animals from England were worthy of any exhibition and opened the eyes of the visitors. As regards keep, attention, and feeding, Germans, and especially Austrians, have much to learn from England. The jury fully recognised their excellence in the awards they gave. The only other exhibitor of the small Windsor breed was Baron Magnus of Drehsa in Saxony; beautiful, faultless animals, but although of rapid development will, through their smaller size, require time to find favour on the continent, as the tender, delicate, well-flavoured meat is not yet sufficiently known to be appreciated. The Academy of Agriculture in Eldena in Pomerania exhibited a pen of 20 medium Berkshires; but with the exception of the purity of this type of race, they were not remarkable, and found but little favour on the score of the keep and attention which had been expended on them. The animals exhibited by Mr. A. M. Schön, of Linderode, near Breslau, consisting of eight specimens of large Berkshires made a very good impression. Among them were some very fine animals. A great number of animals for breeding purposes have of late years been imported into Austria, and particularly Styria, from this herd, and they have bred uncommonly well and influenced most favourably the indigenous breeds. The only other foreigners who took part in the Exhibition of pigs was Mr. Joseph Diethelm, of Brandenburg. He exhibited six oldish sows and a boar. They are among the biggest in the whole show. They are a cross of big Yorkshires with Suffolks. Strongly built animals chiefly white in colour, and well deserving the award of the jury. The price of five months old is 75 thals.; those 11 months old 100 thals. Should the good qualities of these animals descend to their offspring and become a constant breed, it would be difficult to find a better material to improve the breed of pigs. From Skalitz, the domain of Prince Schaumburg Lippe, were also some very handsome animals of this crossing. Altgraf Salm-Reifferschied of Walecow, in Bohemia, exhibited a number of very fine animals of Lincolnshire breed, some of them the originals purchased from Mr. Duckering, and they were decidedly preferable to those exhibited by that gentleman on account of the thick growth of hair on their bodies. These animals were not only awarded a medal, but the special jury gave them the Hamburg prize of 500 florins and the silver cup. It may be mentioned that only animals from the Austro-Hungarian empire could compete for this prize. The domain of Smiric in Bohemia sent eight animals of Suffolk breed, medium size, of pure white colour, thickly coated with hair and with long hanging ears. All, especially the old boar, showed care and attention. The sow with the litter of eight showed to disadvantage alongside the rest, and the young ones hardly warranted the price demanded of 40 florins each. They had probably suffered from their journey. Of the Smiric breed many young animals are yearly sold for breeding purposes, and on the occasion of the Exhibition large orders were given at prices for young pigs eight to ten weeks old, varying from 30 to 40 florins a piece.

The collective exhibition of the Imperial Agricultural Society of Vienna comprised a number of Suffolks, under the name of "large English breed"; fine, well-shaped animals with dense hair and of rapid development. Nearly all of them were adjudged an award by the jury. It is evident that crossing with pigs of English breed is of the greatest importance, and it is decidedly better to breed direct from large imported boars than to breed these at home from smaller sows.

Mr. Jacob Neumayer, of Vienna, showed some Yorkshires bred in England. Noteworthy were three sows with young, enormous, magnificently developed animals. Lot No. 136 drew more than any other in the show. It consisted of a sow and litter of eight. The sow, which was said to be of Yorkshire breed, was white in colour, and the young ones were quite white, and so strong and big that though only two months old they were taken for four at least and gave their mother a great deal of trouble. They had long hanging ears, and were faultless in shape, and eagerly bought up, at 60 florins a piece. Had the jury been able to get some further insight into Mr. Sommers' breeding establishment, &c., there is no doubt but that the Hamburg prize would have been awarded him.

Italy sent two pigs, a boar and a sow, small insignificant animals, and it must have been out of respect for the memory of their ancestors, as it is well known that the small Neapolitan pig was formerly much used by the English in crossing, that the jury awarded them a prize.*

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* The Chinese pig has been more largely used for improving the English breeds than any other.

Hungary so rich in fine pigs was not represented as numerously as had been expected, though specimens of the best and most known breeds were then showing their great capacity for putting on flesh. There were to be seen the different breeds of Mangalicza, Salontaer, Okanyer, Milos, Kisjenöer, Mezöhegyes and Symics, and they were all much admired. Each breed was represented by brood animals, and those destined for the butcher. The principal exhibitors were Count Bethlen, Count Teleky, Ladislaus Tisza, in Transylvania; Count Wenkheim in O-Kigyos, Bernard Deutsch in Arad; Abraham Schwarz, and Prince Sulkovsky in Hungary. The most valuable animals were those of Mr. Pfieffer of Oedenburg; three of them weighed 655, 676, and 688 lbs. respectively, of Symics breed, and a fourth crossed with Suffolk turned the scale at 735 lbs. They were all three years old. Experts declared that the cross between the Hungarian breeds and the English gave excellent results.

LIST OF BRITISH JURORS FOR LIVE STOCK.

W. H. Maxwell, Esq., M.P., Vice-President.
M. Stewart, Esq.
Lieut.-Col. Michael.
R. C. Yeoman, Esq.
Professor Wrightson.
J. W. Paine, Esq.
C. Pegler, Esq.

SUPPLEMENTARY JURYMAN.

Lieut.-Col. Goodenough, R.A., Military Attaché.

EXPERTS.

R. Russell, Esq. (Cattle or Pigs).
T. Fulcher, Esq. (Cattle or Pigs).
J. K. Fowler, Esq. (Sheep).
R. Kirbell, Esq. (Cattle or Pigs).

MR. THOMAS WEBSTER, Q.C.

INTERNATIONAL PATENT CONGRESS.

VIENNA UNIVERSAL EXHIBITION, 1873.

REPORT on the INTERNATIONAL PATENT CONGRESS by THOMAS WEBSTER, M.A., F.R.S., one of Her Majesty's Counsel.

MAY IT PLEASE YOUR ROYAL HIGHNESS,

IN accordance with the instructions received from the Royal Commission of the Vienna Universal Exhibition, presided over by your Royal Highness, and on the invitation of the Baron von Schwarz-Senborn, Director-General of the Exhibition, I attended and took part in the Congress at Vienna for the consideration of questions relating to patent protection for inventions.

Exhibitions in connexion with claims and rights of inventors.

In the present state of the laws affecting inventors and their inventions, the recurrence of each exhibition of the industry of all nations gives rise to, in fact necessitates, a consideration of the claims and rights of inventors in the industrial arts. The claims of inventors should be carefully distinguished from the rights of inventors; the former express the views of individual inventors, or of the advocates of what have been called the natural rights of inventors; the latter express the views of the State as to what rights should be accorded to inventors. The natural right of an inventor is the right of keeping to himself that of which he has sole possession, and of making such use of it in secret as he may be able; no natural right exists in respect of a published invention. It may be for the interest of the State that the knowledge of the invention should be secured; that the risk of the knowledge of the secret dying with the inventor should not be incurred; that others should be stimulated to progress in the same direction; and it is just that the inventor and introducer of inventions of merit and confering benefit on the public should be rewarded and remunerated for their labour, skill, and enterprise. By the general consent of civilized nations it has been thought expedient to endeavour to attain these objects by the grant, for a limited period, to the inventor, of exclusive privileges in respect of his invention; the privileges so granted constitute the rights of the inventor; these are the creation and creature of the law of each State.

Rights the creation of the State.

These exclusive privileges in an individual constitute property in the invention; in the creation, title, and administration of which, as of other property, great differences may exist.

System prior to 1851.

The system of protection existing in the United Kingdom of Great Britain and Ireland, prior to 1851, was inadequate to secure that exposition of the industry of all nations of the world, which it was the object of the Great Exhibition, 1851, to secure. Not only were there separate patents for England, Scotland, and Ireland, but the law of the United Kingdom recognised no rights in an inventor and no property in his invention except under a patent, the obtaining of which was surrounded with difficulties, and involved a cost, and delay which in many cases would be prohibitory of its attainment. There was, to say the least, something unreasonable in inviting inventors to unfold the results of their labours without security against those labours being appropriated by others.

Invention progressive.

Invention is essentially progressive; the exposition of an invention not actually protected by patent would, according to the existing law, have been an abandonment of all claims to individual rights in such invention; it would be an invitation to rivals or competitors in trade to adopt that upon which years of intellectual and manual labour might have been spent. Instances are not wanting of liberality and public spirit in the abandonment by inventors of their inventions and of hesitation on the part of manufacturers in adopting inventions so abandoned, but an invitation to exhibit new inventions without protection could not fail to check or to be repressive of the progressive spirit essential to the most complete success of an exposition of the industry of all nations; and inventors generally cannot be expected to exhibit new inventions, or manufacturers to refrain from copying inventions, not protected by patent, or inventions abandoned and dedicated by their inventors to all mankind.

Exposition without protection.

Effect of Exhibition, 1851.

The advent of the Great Exhibition, 1851, gave such prominence to and rendered so important these considerations that the legislature was induced to give provisional protection to inventions, which might be the subject of patents, exhibited at the Exposition of the Works of Industry of all Nations, and to make the same principle the basis of a new patent law. This provisional protection so introduced became subsequently embodied in the new patent system for the whole of the United Kingdom. This recognition of the claims of an inventor in respect of an invention not actually protected by patent has met with universal approbation.

Provisional protection.

Adoption of provisional protection.

Provisional protection was also adopted for the Paris Exhibitions of 1855 and 1867, and for the London Exhibition of 1862, with many important results.

The announcement of a Universal Exhibition at Vienna, was followed by a special law of the Austro-Hungarian Empire, of the 13th of November 1872 (App. X.), giving provisional protection to any inhabitant, of the Austro-Hungarian Empire, or of any foreign country, who should exhibit any object for which a patent or protection by trade mark or design could be granted. This is the widest extension of the principle of provisional protection adopted by any State; it extends to and includes designs and trade marks as well as inventions; thus recognising all the forms in which intellectual labour may be employed or embodied in the industrial arts, whether on a product or as a means or method of production, or for ornamentation, or for utility, or as indicative of any special producer or manufacturer, or of any special product or manufacture in the industrial arts.

Vienna Exhibition.

Extension of provisional protection.

Each civilised nation, on the opportunity arising, has thus recognised protection to the inventor of, and property in, new and useful products, or means of production in the industrial arts, or, in other words, has recognised property in the intellectual as well as in the physical labour employed in, or which may have contributed to, such results.

The results, however, of such exhibitions in their advent and realisation have not rested here. The experience of exhibitors led to the conclusion that the laws of most nations are inadequate, not only in the interest of the inventor but in the interest of the State. Hence advantage has been taken of the opportunity afforded by the meeting of so many persons interested in inventions to consider the principles and administration of the system of protection by patents in each country. The inventors, of the United Kingdom of Great Britain and Ireland, and of the United States of America, had a common ground of union and co-operation in asking for themselves and for other nations the adoption of a patent system similar to the systems which are believed to have contributed so much to the development of national industry in their respective countries.

Other results.

Co-operation of inventors.

To the consideration inducing special legislation in Great Britain on the advent of the Great Exhibition, 1851, were added others in connexion with the Vienna Exhibition, specially arising out of the patent system of Austria-Hungary, and other countries. It is part of the policy of States to encourage the importation or introduction of inventions from other countries, subject, however, to certain conditions of their being worked within the country, so as to lead to the formation of manufacturing establishments and the application of capital at home, from which the results of industry might be supplied, instead of being

Imported inventions.

imported from other countries. During the last few years a rapidly increasing trade has grown up in imported articles, the subject of protection, or of patent right, in the countries from which they are imported. A competition has also sprung up between the manufacturers in the importing and in the exporting countries, the former taking advantage of the absence of protection in the countries to which the inventions are so imported.

Competition.

An exhibition of the industry of all nations in which exhibitors having protection for their inventions in their own countries, but no protection for inventions introduced for the first time into such exhibition would facilitate and promote competition with themselves in the very inventions upon which their trade was built. Such a check to a full exposition of the industry of all nations, which under existing circumstances was practically more serious than existed in reference to the Great Exhibition, 1851, had to be removed; this was effected by the Austro-Hungarian Law of 1872, already referred to.

Views of promoters of Vienna Exhibition.

The founders and promoters of the Vienna Exhibition did not stop here; they gave encouragement to a full consideration of the question of the policy of patent protection; to the question whether, in the interest of the State, the claims of inventors to the acquisition of exclusive rights in their inventions should be recognised, and whether, if so recognised, the existing system of giving property in such inventions is the best for the inventor and the State.

Programme of Vienna Patent Congress.

The Vienna Patent Congress was founded on a programme (No. 80) issued in March 1873 by the Archduke Regnier, President, and the Baron von Schwarz-Senborn, Director-General of the Exhibition. (See A. in Appendix.)

That programme points to the question of patent protection, or in other words, of property in inventions in the industrial arts, as one of the disputed questions in the province of politico-economic legislation, specially deserving consideration at the present time, and on an occasion in which so large a body of thoughtful and industrious men, labourers in the direction of art, industry, and science, would assemble to bear testimony to the high degree of culture to which education and intellectual labour had advanced and was advancing the human race.

That programme suggests,—

Programme of Patent Congress.

"That notwithstanding the number of years during which protection for property in inventions had been recognised by civilised nations, the controversy as to its policy had only arisen within the last few years; that, though so recent, it had a history peculiarly its own, arising out of or referable to—the recognition of the principles of free trade, as evidenced by the adoption of a liberal customs policy—the results of steam and electricity in uniting isolated seats of industry and in promoting the interchange of materials and commodities, and the intercommunication of all nations—the consequences of restricted competition of labour, skill, and capital in countries recognising and having patent protection, and of unrestricted competition in countries not recognising or having such protection;—the disturbing effects of the abstraction of skilled labour from countries having no such protection,—the attraction to and concentration of skilled labour in countries having such protection."

Progress of industry and science.

"That the question is no longer confined to considering how the right of the inventor is to be recognised and protected in the manner most conformable to his interest and the general convenience of the public, but that his very right is challenged, and, it is said, that the duty is now imposed on the advocates of such protection and property to remove doubts and scruples respecting the practicability and economical utility of such protection and property."

Patent right challenged.

"That two parties exist, the watchword of one being the total abolition of patent protection, of the other its maintenance and reform; that such reform is no longer a reform within certain territorial limits or countries, but an assimilation of the patent systems of all countries on some general principles or common ground, as the basis of an international system."

Abolition or reform.

The authors of this programme did not disguise the fact that the solution of this question would be difficult and tedious; they were, however, fortified by the consideration that its impracticability had not been proved; that the objects in view and the results to be attained were deserving the effort; that the Great Exhibition of 1851 had the effect of thoroughly arousing attention to the defects of the British system of patents, and of leading to the adoption of provisional protection for exhibitors of new inventions, and to the subsequent legislation of 1852; that at the subsequent Exhibitions at Paris in 1855 and 1867, and at London in 1862, and in the preparatory Acts for the Vienna Universal Exhibition of 1873 the same principle of provisional protection had been adopted.

Difficulties of question.

The authors of this programme were of opinion that the Vienna Exhibition of 1873, called for the embodiment of universal progress in culture, would be an occasion peculiarly adapted to pay tribute to the spirit of invention under the exigencies of the present times and according to the views of modern legislation, and as in the case of

New era for inventions.

the Great Exhibition, 1851, would be the era or starting point for the codification of the rights of inventors.

Union of Patent Congress with Exhibitions.

In accordance with these views, countenanced as they were by the Government of the United States of America, the leading promoters of the Universal Exhibition in Vienna proposed to unite with the Exhibition a Congress specially devoted to the discussion of the question of patent right, and that such Congress, in the event of a vote in favour of patent protection, should proceed on the basis of the experience of the nations there represented and of the materials there collected, to a declaration of the fundamental principles of an international reform of patent legislation. The Congress was to consist of artizans, manufacturers, political economists, and experts in the industrial arts, it being reserved to the Governments of the exhibiting nations to be represented at the Congress by special delegates.

Application of term international.

Through some misapprehension of the term international, which would appear to have been supposed to apply, or to have been referred, to the character rather than to the objects of the Congress, viz., the establishment of an international patent law or system, a difficulty arose as to the appointment of special delegates by the respective Governments of the exhibiting nations, as contemplated by the programme; accredited representatives, however, were present from most of the exhibiting nations and served to constitute a large representation of the industry of the civilized world. (See Lists in Appendix B.)

Preparatory Committee.

In furtherance of the objects of the Congress, and in accordance with the scheme as stated in the programme, a committee of preparation, or a Preparatory Committee, was appointed at the seat of the general direction at Vienna, charged with the duty of preparing the materials to be laid before the Congress, of elaborating the matters of inquiry, and generally to arrange all preliminaries for the opening of the Congress. To this Committee were added from time to time persons specially conversant with the patent systems of other countries. (See List in Appendix B.)

Invitations.

Invitations were forwarded by the Director-General of the Exhibition to R. A. Macfie, Esq., M.P., the well-known advocate of, and author of a work on, "The Abolition of Patents," to Dr. Haseltine, of London, and to the author of this Report. Mr. Macfie was unable to attend, but he sent a written communication which was read at the Congress (see Appendix D.); the two latter attended and took part in the proceedings of the Congress.

Other proceedings.

Frequent reference was made in the course of the Congress to proceedings in London, and especially to the recommendations of the Select Committee of the House of Commons on Patents for Inventions during the Sessions of 1871 and 1872 (see Appendix E.). That committee reported, amongst other things, in March 1872, in favour of an international system of patents, and of arrangements whereby the law and practice of different nations might be assimilated. On the 23rd of July 1872 a deputation waited on Earl Granville in support of this recommendation and in favour of action being taken thereon. (See report, recommendation, memorial, and reply in Appendix C.)

Reports to Parliament.

The result of this deputation was the valuable collection of reports from Her Majesty's Secretaries of Embassy and Legation respecting the law and practice in foreign countries with regard to inventions, presented to both Houses of Parliament by command of Her Majesty in the Session of 1873. The attention of the House of Commons was also called in the Session of 1873 to the approaching Patent Congress at Vienna.

Meeting in London.

Advantage was taken of the presence in London of the Assistant-Commissioner of Patents for the United States of America (the Hon. J. M. Thacher), and several others on their way to Vienna, to hold a meeting (21st July 1873) of English, American, and foreign inventors, and of others interested in inventions, and their representatives, at which B. Samuelson, Esq., the chairman of the Select Committee of the House of Commons on patents for inventions during the Sessions of 1871 and 1872, presided—When it was

Resolved,—

Deputation to Earl Granville.

"That a deputation wait upon Earl Granville to represent to him that, returns having been obtained from our embassies and legations abroad in reference to the patent laws of other countries, it is expedient that advantage should be taken of the meeting of the Congress on patents at Vienna, in order to further the resolution of the Select Committee of the House of Commons on patents for the sessions of 1871–2 in favour of international patent laws."

"That Mr. Macfie, M.P., be requested to accompany and introduce the deputation."

The reply to the communication to Earl Granville founded on this resolution will be found in the Appendix. (See Appendix C., p. 412.)

At a subsequent meeting, 23rd July 1873, it was further resolved,—

Deputation to American Minister.

"That a deputation wait on General Schenck to request his assistance towards obtaining the co-operation of the Foreign Office in furthering the objects of the Patent Congress at Vienna by appointing or recognising accredited persons to take part in that Congress."

At the same meeting the differences in the patent systems of England and of America were considered, with a view to the assimilation of the systems of the two countries.

Through circumstances beyond control, and unnecessary to be further noticed in this Report, action in the precise direction indicated by the foregoing resolutions was prevented, but the main object was attained and persons proceeding to the Patent Congress were accredited by their respective Governments to their representatives at Vienna.

Labours of Preparatory Committee.

The Preparatory Committee appointed in pursuance of the suggestion in the Programme entered on its labours with great energy, and elaborated a series of questions having reference to;—the international rights of inventors—the boundaries of those rights—whether such boundaries should be international or territorial—the granting, cost, lapsing, and duration of patents—the administration of the Patent Office, and the securing of international arrangements somewhat analogous to those existing in case of copyright.

The difficulties presented by so extensive a field for discussion;—by the differences which the strongest advocates of patent right admitted to exist between patent right and copyright, and by circumstances which might render expedient territorial distinctions in the administration of a patent system and of a law founded on a common principle, as in the case of other property;—were so great that the Programme was restricted to general principles of law and of administration, and the Preparatory Committee prepared and proposed a series of resolutions and reasons which were submitted to, and adopted by the Congress without any material alteration in principle.

First meeting of Congress.

The first meeting of Congress was held on Monday the 4th of August at the Jury Room in the Exhibition Building at Vienna. Upwards of 250 persons were enrolled members of the Congress in their personal or representative capacities, and upwards of 150 attended its meetings.

The Congress was opened by the D[illegible]tor-General of the Exhibition, Baron von Schwarz-S[illegible] with [illegible] general observations in German and also i[illegible] objects of, and as to the mode of conducti[illegible]

President and officers.

The Baron was appoi[illegible] Hon[illegible] Dr. C. W. Siemens, of Lo[illegible] f the Congress.

The Vice-presi[illegible] were appointed and [illegible] atory Committee. (S[illegible]

Arrangement of proceedings.

The program[illegible] the meeting and of [illegible] eed that the discussion should take place in the German language; that the English, French, and Italian languages should be allowed; that the resolutions and amendments should be read in German and also in English, and that it should be left to the President to repeat in English or German such portions of the discussion as appeared to be material. This delicate and difficult task was performed by Dr. Siemens to the most perfect satisfaction of the members present at the Congress.

Communications were read from Prussia, Italy, Bavaria, Saxony, Wurtemburg, Belgium, Spain, Greece, and the United States, expressing the approval of their respective Governments of the objects of the Congress, and of their willingness to co-operate in forwarding its objects. (See Appendix B.)

Proceedings 4 and 5 Aug.

The discussion on the general subject of patent protection was opened by the General Secretary of the Patent Congress, Carl Pieper, C.E., of Dresden, by an elaborate statement of the whole subject, and of the questions for consideration and discussion.

The first resolution, with the reasons in support thereof, was as follows:—

First resolution and reasons.

I. The protection of inventions should be guaranteed by the laws of all civilised nations—because:

(*a.*) The sense of right among civilised nations demands the legal protection of intellectual work.

(*b.*) This protection affords, under the condition of a complete specification and publication of the invention, the only practical and effective means of introducing new technical methods without loss of time, and in a reliable manner, to the general knowledge of the public.

(*c.*) The protection of invention renders the labour of the inventor remunerative, and induces thereby competent men to devote time and means to the introduction and practical application of new and useful technical methods and improvements, and attracts capital from abroad, which, in the absence of patent protection, will find means of secure investment elsewhere.

(*d.*) By the obligatory complete publication of the patented invention, the great sacrifice of time and of money, which the technical application would otherwise impose upon the industry of all countries, will be considerably lessened.

(*e.*) By the protection of inventions, secrecy of manufacture, which is one of the greatest enemies of industrial progress, will lose its chief support.

(*f.*) Great injury will be inflicted upon countries which have no rational patent laws, by the native inventive talent emigrating to more congenial countries, where their labour is legally protected.

(*g.*) Experience shows that the holder of a patent will make the most effectual exertions for a speedy introduction of his invention.

The reasons accompanying the above resolution were suggested by Dr. Werner Siemens, of Berlin, in substitution for the reasons originally proposed by the Preparatory Committee; the two sets were substantially the same; but those of Dr. Werner Siemens were approved by the Committee and adopted by the Congress, as affording more specific grounds for discussion. It will be convenient to adhere to these reasons in their order in the present report of the discussion.

Reasons.

The reason "that the sense of right amongst civilised "nations demands the legal protection of intellectual work" was put forward in reference to objections denying all claims or rights of the inventor; it was urged that there was the option of keeping the secret to himself; that its publication should be deemed a virtual abandonment of the invention for the benefit of mankind; that knowledge was free to all; that countries in which protection did not exist had the advantage of adopting the inventions of the whole world. The argument founded on these suggestions was strongly combated, and the conclusions repudiated as fallacious, unjust, and impolitic. The recognition of property in inventions was said to be analogous to the recognition of property in the first occupier or first finder; that, as in the case of minerals, there may be property in the Crown or in the Government, in the proprietor of the land, and also in the first finder of the minerals; or, as in the case of water rights, there may be property independent of any property in the particles of the water; or, as in books and the fine arts, absolute property in the author.*

Copyright in America.

Special reference was made to there being no copyright in the United States of America in respect of books written by authors of and published in foreign countries, and speakers from America strongly reprobated this state of things, and declared their conviction that public opinion in their country would ere long pronounce in favour of an international copyright law.

The opinions of Sir W. Armstrong and Mr. Macfie were referred to; it was explained that their objections had reference to the system of reward by giving property to the individual; that they did not think that the inventor should go unrewarded; that although Sir W. Armstrong had declared himself unprepared to propose any other system of reward, Mr. Macfie (see Appendix F.) had proposed an International Patent Law and a contribution by each State as the means of reward. Such a system of reward or remuneration to the inventor was objected to as unjust, inasmuch as it would be a levy by the State on all its taxable subjects, instead of a contribution by those only who required to use the invention; but it was justified on the ground that every one of the public received directly or indirectly benefit from the progress of invention. It was urged that reward or remuneration by property for a limited period in the invention was the only practicable and just mode of attaining the end, and most consistent with the sense of justice, as a means of reward apportioned to the merit. The opinion expressed against the recognition of any right in inventors to exclude others from the use of their inventions evoked strong language in reply; persons were not wanting to designate such appropriation as pillage and robbery; no attempt, however, was made to give effect to such sentiments by an amendment or formal resolution, and the meeting seemed inclined to acquiesce in the observation, that such strong language was unnecessary in support of a case that rested on so good a foundation as the claim of inventors.

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* See Report of Dr. Klosterman, App. R., *post*, p. 502.

Patents not in conflict with principles of free trade.

The objection that patents are in violation of or inconsistent with the principles of free trade was also insisted on: to which it was replied that the analogy wholly failed; that the object of patent protection or of individual property in an invention was the creation and encouragement of a trade which had no existence, but which would be called into existence during the limited period of protection, and become free at the expiration of that period; that a patent was in no sense a monopoly within the meaning of the monopolies declared to be illegal, and by which persons were restrained of some freedom or liberty that they had before, or hindered in their lawful trade as being compelled to buy some well known commodity, as corn, wine, oil, or salt of some particular court favourite at exorbitant prices; that a monopoly was a taking away an existing right enjoyed by all and giving it to one; that the exposition of what is new cannot be an action against freedom; that every one may be benefited thereby, and would be indirectly damaged if not allowed to obtain it, except as the result of the operation of a secret practice.*

Patents not monopolies.

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* See Report of Dr. Klosterman, App. R., *post*, p. 502.

Principles of copy and patent-right.

That, although distinctions may exist between copy-right and patent-right, the principle or ground of protection for all intellectual work was the same, viz.: labour bestowed and services rendered for instruction of mankind and the progress of the industrial arts. That the recognition of property in the objects or results of labour and in the acquisition by the first occupant of an unoccupied territory rest on the same sense of justice, viz., labour expended, but that no property is recognised in objects upon which no labour has been, or can have been bestowed; that the recognition of labour bestowed is the basis of property.

That the true view of patents was payment for services rendered, founded on the assumption that invention was a service rendered to the State.*

> (*b*.) This protection affords, under the condition of a complete specification and publication of the invention, the only practical and effective means of introducing new technical methods without loss of time, and in a reliable manner, to the general knowledge of the public.

Introduction of new technical processes.

Upon this reason little discussion took place; it is but the expression of the uniform practice of requiring the filing of a specification containing precise information as to the manner in which the invention is to be performed. The immediate publication of the specifications by the authorities of the United States Patent Office was favourably spoken of as contrasted with the delay which takes place in the United Kingdom. It may be mentioned that abstracts of specifications issue weekly from the Patent Office in the United States, with reduced illustrations printed by photo-lithography, in the Official Gazette of the United States Patent Office. The specifications *in extenso* with plans issue monthly.

The novelty of a new idea, though not adequately carried out, may by such publication produce incalculable consequences.†

> (*c*.) The protection of invention renders the labour of the inventor remunerative, and induces thereby competent men to devote time and means to the introduction and practical application of new and useful technical methods and improvements, and attracts capital from abroad, which, in the absence of patent protection, will find means of secure investment elsewhere.

Capital attracted.

It was asserted by the opponents of patent protection that such protection is unnecessary, but no attempt was made to combat the foregoing proposition. Reference was made to the facility with which capital is obtained in the United States for working patents as evidence of the security of patent property in that country. It was stated that a very large proportion of the capital embarked in the industrial arts in the United States was advanced on the security of patents: that invention was thereby made a recognised and respected calling in the United States: that many foreigners were attracted there by the patent system; and that of such foreigners who became successful inventors a very large proportion were Germans.

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* See opinion of M. Renouard, App. S., p. 511.

† See in App. L., *post*, "Proposals for a New Patent Law," pp. 430-438.

In reference to the recent abolition of patents in Holland it was stated that this very attraction of capital was regarded as an objection to patents, the number of native inventors being extremely few. That Holland would be prepared to adopt a good patent law.

> (*d.*) By the obligatory complete publication of the patented invention, the great sacrifice of time and of money, which the technical application would otherwise impose upon the industry of all countries, will be considerably lessened.

Benefit of publication.

This reason taken in connexion with the preceding reason (*b*), affirms the advantage resulting from a compliance with the condition as to filing of a specification adequate and sufficient for the instruction of the trade.

> (*e.*) By the protection of inventions, secrecy of manufacture, which is one of the greatest enemies of industrial progress, will lose its chief support.

Check on secret practices.

The publication and record of inventions has always been represented as a prominent feature of the patent system. There is reason for supposing that even under the patent system secret manufacture is not altogether extinguished, but it is certain that without a patent system the temptation to secrecy in manufacture would be greatly enhanced. Processes that could be kept secret would be kept secret, and as regards other processes, inventions would either not be made or the progress of invention would be retarded. It was not asserted that without a patent system invention would absolutely stop, but that its progress would be very slow under the withdrawal of the stimulus of the protected application of capital.

The consequences of secret manufacture in retarding progress, and in maintaining prices, as contrasted with the effect of open manufacture under a patent system on progress in the industrial arts are very serious.

The bribing of workmen and the attempts to discover the means resorted to in the prosecution of a successful secret trade must not be disregarded in the category of evils to which secret manufacture gives rise. Reference was made to several cases, amongst which that of Crompton, who carried on the use of his invention of the spinning mule in secret for a time, is one of the most remarkable and lamentable on record.

Secret practice without, as contrasted with open practice under, the protection of patents is stated, on the experience of competent persons, to be obstructive of improvement.* In cases in which the secret could be maintained there would be from generation to generation a perpetual tax on the public, and a practical monopoly of the most odious description. The successive improvements in a staple manufacture, due to the exercise of many minds devoted to that object, is seriously interrupted, if not actually stopped. In machines and other mechanical apparatus, the result discloses the invention and the inducement to invent, that which any one may adopt, is wanting, and invention is not made except accidentally, and, as it were, spasmodically. In other cases in which the result or product gives no trace of the means employed, the secret may be kept and the invention lost.

> (*f.*) Great injury will be inflicted upon countries which have no rational patent laws, by the native inventive talent emigrating to more congenial countries, where their labour is legally protected.

Emigration of invention talent.

The mischief from this cause has been made of little account by the countries that have suffered most. Evidence was given by Dr. Siemens before the Select Committee of the House of Commons, 1872, to the effect that he had left his native country, Prussia, and had adopted England, because of its patent laws. Numerous instances could be cited of inventors taking their inventions from their own to other countries. Bodmer, a Swiss, brought many highly useful inventions to England, and by the aid of capital supplied in that country, formed large trade establishments. The case of Heilman is well known. No reasonable doubt can be entertained as to the fact of the great inducement which protection to or property in inventions offers for emigration to and settlement in countries where protection exists, and of the attraction of such protection for inventions to capital.

The unanimous testimony of American inventors was in support of the above proposition. It was also stated that the largest class of foreign inventors in the United States were Germans, who received less protection in their own country than other foreigners in their respective countries.

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* See evidence of Siemens, Muspratt, and Mundella before Select Committee of House of Commons, 1872.

(*g.*) Experience shows that the holder of a patent will make the most effectual exertions for a speedy introduction of his invention.

Value of exertions of inventors.

Some difference of opinion was expressed in the course of the discussion as to the purport of this proposition, and reference was made to cases in which the inventor had failed to introduce his invention until assisted by or associated with a capitalist; but on its being explained that the inventor with such an associate was to be regarded as practically the holder of a patent, the proposition as expressed was acceded to.

The inability of an inventor to introduce an invention for want of capital is in no respect in conflict with the foregoing proposition. The opposition of capital embarked in an existing manufacture has to be overcome; the prejudices of mankind against that which is new and untried have to be broken down. An inventor engaged in such a crusade is as a voice crying in the wilderness, proclaiming to the sons of toil, relief to their bodily labour; to the manufacturer, economy in production; to all, increased facilities for the enjoyment of life. Each inventor, as he forces his invention on the unwilling recipient, is fulfilling a mission for the instruction and education of mankind in the industrial arts. The parent of the invention should be the best educator for those who are to adopt the invention. The enthusiasm of the inventor is more likely to overcome the indolence of mankind than the mere commercial spirit of the owner of the patent.

Voting on resolution.

No formal amendment was moved on the foregoing resolution or the reasons in support thereof, and the resolution, with the reasons, was adopted by the Congress, seventy-four (74) voting in favour, and six (6) against it.

Second resolution.

6 August 1873.

II. The second resolution finally submitted to the Congress was as follows:—

An effective and useful Patent Law should be based on the following principles:

(*a.*) Only the inventor himself, or his legal representative, should be entitled to a patent.

(*b.*) A patent should not be refused to a foreigner.

(*c.*) It is advisable, in carrying out these principles, to introduce a system of preliminary examination.

(*d.*) A patent should be granted either for a term of fifteen years, or be permitted to be extended to such a term.

(*e.*) Simultaneously with the issue of a patent, a complete publication of the same should take place, rendering the technical application of the invention possible.

(*f.*) The expense of obtaining a patent should be moderate; but, in the interest of the inventor, a progressive scale of fees should be established, enabling him to abandon, when convenient, a useless patent.

(*g.*) Facilities should be given, by a well-organised patent office, to obtain in an easy manner the contents of the specification of a patent, as well as to ascertain what patents are still in force.

(*h.*) It is advisable to establish regulations according to which the patentee should be compelled, in cases in which the public interest may require it, to allow the use of his invention to all suitable applicants for an adequate compensation.

(*i.*) The non-application of an invention in one country shall not involve the forfeiture of the patent, if the patented invention has been carried into practice at all, and if it has been rendered possible for the inhabitants of such country to purchase and make use of the invention.

(*k.*) In all other respects, and particularly as regards the proceedings in the granting of patents, the Congress refers to the English, American, and Belgian Patent Laws, and to the draft of a Patent Law prepared for Germany by the Society of German Engineers.

Most of the foregoing paragraphs were treated as distinct sub-resolutions, and passed separately after amendment and discussion; they were subsequently passed altogether as one resolution. It will be convenient to consider each separately, in the order in which they stand.

(*a.*) Only the inventor himself, or his legal representative, should be entitled to a patent.

Patent to inventor only.

In the discussion on this sub-resolution special reference was made to the practice (referred to in the memorial to Earl Granville, Appendix D., p. 410), of obtaining early information as to inventions in one country, and applying for patents for the invention in another country, by persons having no connection with, or any authority from the inventor.

Patents of importation.

Attention was also called to the granting of patents for inventions in use in other countries, but not known in the country to which the invention was so imported or introduced. The practice in Englamd is to grant patents for any invention not in use within the realm; the applicant represents himself either as the true and first inventor within the realm, or, as in possession of an invention by reason of a communication from some person (naming him) abroad. In case of his acquiring personally the knowledge of an invention by

Practice in England.

foreign travel, he simply represents that he is the true and first inventor within the realm, or that he is in possession of an invention which is new to the best of his knowledge and belief within the realm, such statement being verified by the affirmation, oath, or solemn declaration of the applicant. To this practice various objections were urged. Reference was made to the recommendation of the Select Committee of the House of Commons, as follows:—"That letters "patent shall not be valid for an invention which has been "in use in a foreign country, unless a patent for the same "shall have been granted in such country, and unless such "letters patent shall have been granted in this country to "the original inventor, his assignee, or authorised agent."

Resolution as to.

Proceeding 6 & 7 Aug. 1873.

Foreign inventions.

The expression "his legal representative" was understood in the discussion to include his nominee or authorised agent. With this explanation the sub-resolution was accepted by the Congress as sufficient to secure the rights of the inventor in all countries; some difference of opinion was expressed as to what period, whether six months or two years, should be given to the inventor for the assertion of his rights in other countries.

Practice in United States.

In Austrian Hungary.

The practice in different countries as to granting patents for inventions not the invention of the grantee or in use in other countries is very various. In the United States any invention in use in other countries may be patented, provided the same has not been in public use in the United States for two years prior to the application, and has not been patented or described in a printed publication. If the same has been patented in a foreign country or countries the patent will only be granted to the grantee of that patent or his representatives, and the patent so granted will expire with the expiring of the first of such foreign patents. In Austrian Hungary the patent is granted only to the inventor or his accredited agent, and for an invention not in use within the empire. The practice in some other countries is to grant the patent only to the true and first inventor or his accredited agent. The general recognition of this as the law and practice in all countries would be the first step, and is, in fact, essential to the establishment of any system deserving the name of international. In such a system there must be no conflict as to the character of the person to whom the patent is granted. In most countries the term of the imported patent expires with the original patent. The practice in England of extending the term of patents by a fresh grant to the original grantee or to his assignee does not in any way militate with the above resolution, inasmuch as the assignee is supposed to represent the whole merit of the inventor. The Judicial Committee of the Privy Council in several recent cases have refused to recommend the extension of a patent to the grantee of an imported invention in cases in which one of several foreign patents had expired.

The grant of letters patent to the inventor only, or to his representative, may be regarded as an effective means of checking the system of stealing and patenting inventions in other countries by persons on the look out for and obtaining early information as to what was going on, a practice (already referred to) and described as of common occurrence.

(*b.*) A patent should not be refused to a foreigner.

Patent to a foreigner.

The foregoing has reference to a practice formerly existing, but now abandoned in most countries, of either refusing a patent to a foreigner, or to any but citizens, or subjecting aliens to discriminating charges or other disadvantages. Many of the earlier patents in Great Britain were granted to foreigners and aliens—alien enemies as well as alien friends,—the policy of that country being to attract inventions from all parts of the world as the basis of a home manufacture. In Austria-Hungary, in Belgium, France, Prussia, in the United States of America, and in most other countries, no regard is paid to the nationality of the applicant, but patents are granted alike to citizens and strangers. In Saxony, Bavaria, and Wirtemburg the application of a foreigner must be made by a native as the bearer of the patent, and only responsible person. In Canada, until the recent Act, which came into operation 1st September 1872, and in some other countries patents are refused to aliens, but this is now a rare exception. If the granting of patents be sound policy and for the interest of the State all such impediments are contrary to public policy. Invention is the prerogative of man and belongs to no country or clime; the laws of chemistry, mechanics, physics, and nature are the same everywhere, and the invention and inventor of any country should be equally respected without regard to nationality.

(*c.*) It is advisable, in carrying out these principles, to introduce a system of preliminary examination.

Examination and Proclamation systems.

Two systems exist of granting patents,—the one described as the examination and the other as the proclamation or publication system; the former prevailing in the United States of America, in Prussia, and in some other countries; the latter prevailing in the United Kingdom of Great Britain and Ireland, in Austria, Belgium, France, and other countries. Under the proclamation or publication system a patent is granted, as of course, at the sole risk of the applicant, provided the documents are in due form.* Under the examination system patents are granted for what appears, after due official examination by competent examiners, to be new, and refused for what appears to be old.†

In theory, an examination system may be said to exist in the United Kingdom; the Act of 1852 was supposed to have provided for it; its adoption has been repeatedly recommended on high authority; the law officer is to be satisfied of the sufficiency of the provisional specification; the opposition of persons interested is invited by advertisement: but practically the system is non-existent; the theory is a dead letter; the proclamation system virtually prevails, and patents are granted as and for whatever the applicants may ask, provided the documents are in due form, at their own risk, and without any guarantee. The fact that patents are frequently granted for the same invention within the six months during which the provisional specification is secret is strongly confirmatory of the absence of any practical check on the issue of patents for the United Kingdom.

Examination system approved by Americans.

The opinion of the great majority of inventors and patentees in the United States is said to be in favour of the examination system; some are found to raise their voice against it and in favour of the proclamation system, as would reasonably be expected, seeing that under the operation of the examination system as many as one-half the applications in one year have been rejected. Of late years, however, the proportion rejected has not been so great, as will be seen hereafter on a comparison of the number of patents applied for and issued in the United States of America.‡

Indefeasible title.

It is the opinion of some that the examination system might be carried to such an extent as that a guarantee or indefeasible title to an invention might be given, but suggestions to this effect have received little encouragement, and are deemed by many as altogether impracticable.

The extent and nature of the examination may vary, but the importance of some such system, as a check on ignorance and on imposition, can hardly be doubted.

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* A system of registration of inventions, as of designs in England, does not exist; such a system was proposed in 1850 but not adopted; the term "proclamation" implies something different from that of the concession made almost as of course to the applicant.

† The limits of the examination system has been the subject of much discussion; but it may be taken as almost unanimously agreed that it should be confined to primâ facie novelty, and ought not to extend to the merit, utility, or practicability of the invention.

‡ *See* App. I., *post*, p. 426.

Consequences of system.

An examination, if not essential to carrying out the principle above announced as to the grant of patents to the inventor only, or his representatives, and to the exclusion of mere introducers, will materially facilitate the adoption and success of that system. The check, which an efficient examination will interpose to the grant in one country, to a stranger, of a patent for an invention already the subject of a patent in another country, will go far to extinguish the demoralising practices complained of and already referred to. Any furtive attempt by a stranger to appropriate in one country an invention the subject of a patent in another country would be so probable of detection that the practice would cease to be profitable as a trade.

Examination system.

The examination system in the United States was represented as having great effect on the security of patent property, as practically a guarantee of validity, as influencing litigation to such an extent as to remove the charge made against litigation on patents in England "as a speculation on the ignorance of judge and jury." The examination system is a sort of trial before, instead of after, the patent is granted.

The effect of the examination system is shown by the security felt in the application of capital to working out patent inventions. It was stated on good authority that one half of the patents granted in the United States are remunerative, and that from six to seven eighths of the manufacturing capital is based on patents; results which will contrast most favourably with the system of any other country.

Examination limited to novelty.

No inquiry takes place as to the merit of the inventor, or the utility of the invention; the examination is limited to novelty only. The strongest advocates of examination have invariably excluded all questions of, merit, practicability, or utility, as beyond the province of inquiry, and as being in that state of the invention within the region of opinion and not of fact. This is in accordance with the conclusions of the Royal Commission presided over by Lord Derby (then Lord Stanley), and of the recent Select Committee of the House of Commons. (*See post* 393.)

Examination in Prussia.

The examination system as practised in Prussia was severely commented on, special reference being made to the fact that a patent had been refused to Bessemer for his improvements in the manufacture of iron and steel. His application for a patent had been delayed from time to time and was finally refused on the ground that the invention at the time of that refusal was the subject of a printed and published description, namely, the specification of his own patent in the United Kingdom. The strictures on the administration of the patent system in Prussia gave rise to an animated discussion: the fact of the small number of patents granted in that country, and of the consequent discouragement to inventors was not denied. This, however, was asserted to have no connexion with, or to be in no respect due to, the examination system adopted, but to views as to the impolicy of such grants.

Examination advisory and adjuvant.

With respect to the system of examinations as administered in America, it may be doubted whether, looking to the opportunities for a review of the proceedings before the examiners, and the powers of appeal, that system is not practically more advisory and adjuvant than prohibitory; that is to say, whether in the great majority of cases the applicants do not themselves concur in the propriety of the conclusion.

No absolute refusal.

The absolute refusal of patents has been censured on high authority as inconsistent with American views as to the rights of inventors. A Committee of the Social Science Association and Law Amendment Society inclined to this view and recommended that a patent should not be ultimately refused to a persistent applicant, but that the reports of the examiners against the grant should be recorded. This suggestion has many considerations in its favour; it would be a check on the examiners, keeping them up to their duty, and afford ample opportunity for the inventor to reconsider his position.

Facilitated by provisional specification.

The provisional specification under the English system affords great opportunities for an examination system which should be adjuvant and advisory to the applicant. Such a system, as devised by the promoters of the patent law reform which resulted in the Act of 1852, would have given to the applicant the benefit of the accumulated experience of the the Patent Office, would have protected the inventor against his own ignorance, and would have harmonised the views of most of the advocates of the American and of the English systems.

It is impossible, as stated in effect by the Hon. J. M. Thacher, that an examination by the applicant or his agent can be effective and exhaustive; such examination to be of any value must be conducted by independent experts acquainted with the particular subject.

Aid of opponents.

The system proposed and provided for by the Act of 1852, involved another important feature; it called in aid, as opponents, persons interested in the particular subject for which a patent was applied for. No trial has yet been made of this feature of the reformed system, which would obviously be a great aid and stimulus to the efficiency of any official examiners.

The resolution of the Congress in favour of the system of patents founded on examination is not conclusive of one system in preference to another, but simply affirms the principle that patents should not issue as of course and without discrimination; it must be considered as a decision in favour of the examination in preference to the proclamation or registration system.

(*d.*) A patent should be granted either for a term of 15 years, or be permitted to be extended to such a term.

Term of patents.

Upon this resolution little discussion took place. Reference was made to the powers which exist for the extension of the prolongation of patents for the United Kingdom, by the grant of new patents for a term of 7 or even 14 years in extreme cases; also to the abandonment of the power of extensions in America, contemporaneous with the extension of the term of patents to 17 years in all cases, but the foregoing was adopted without amendment. The term of patents in other countries varies from 2 to 15 or 20 years. In some countries, as France, Belgium, Austria, and Bavaria, &c., a system of annual payments exists: in the United Kingdom alone the system of periodical payments exists, under which the duration of patents is reduced to three and seven years, if the prescribed payments are not made, before the expiration of the third and seventh years respectively. The effect of this system was regarded as most satisfactory.

(*e.*) Simultaneously with the issue of a patent, a complete publication of the same should take place, rendering the technical application of the invention possible.

Contemporaneous publication.

This proposition is substantially in accord with and a carrying out of the sub-resolution (*d.*) of the first resolution. The condition of simultaneous publication with the issue of the patent, of full information as to, contemporaneous with the creation of, rights or property in the invention was much insisted on. Reference was made to the delay which takes place in the Patent Office of the United Kingdom in the printing and publishing of specifications. In the United States the publication of abstracts is weekly, and of the specifications *in extenso* monthly.

There is, however, a further consideration in connexion with the publication of these records which ought not to be overlooked. One recommendation in favour of the provisional specification was the record which it would furnish of failure as well as of success in the progress of invention.

The record of a failure may be suggestive as to its cause, and a prelude to success. A history of invention founded on these records would be of inestimable value to labourers in the industrial arts. Such a history, however, could only be furnished by the accumulated experience of the Patent Office; it was one of the works contemplated and provided for by the Act of 1852, and towards which some progress has been made by the abstracts of specifications prepared and published under the authority of the Commissioners of Patents.

Record of failure and history.

> (*f.*) The expense of obtaining a patent should be moderate: but, in the interest of the inventor, a progressive scale of fees should be established, inducing him to abandon a useless patent.

Cost of patents.

No precise amount was fixed on or suggested at the Congress as the limit for the expense of obtaining a patent, but, having reference to the charges in other countries, the expense of a patent in Great Britain, that is, 25*l.* as a first payment, 50*l.* as a second payment before the end of the third year, and 100*l.* as a third payment before the end of the seventh year, was thought to be very large. It was suggested that the payment should be limited by the necessary cost of the system, which should be self-supporting; the cost of the system having been ascertained the charges should be adjusted accordingly. The second and third payments under the British system were not fixed with reference to the cost of the patent system, but suggested by the promoters of the Act of 1852 as a means of effecting the abandonment of patents for useless inventions or inventions not in profitable use to the owners, so as to effect the object set forth in the sub-resolution under consideration.

A system of increasing annual payments was suggested to and considered by the Select Committee of the House of Lords in 1851, but the system of two increasing periodical payments, was thought to be less vexatious and more efficient and consequently adopted. A system of annual payments, as in Belgium, France, &c., is not generally approved. It operates however forcibly in effecting abandonments especially on an increasing scale. (See *post* 371 as to Belgium Patents).

> (*g.*) Facilities should be given, by a well-organised Patent Office, to obtain in an easy manner the contents of the specification of a patent, as well as to ascertain what patents are still in force.

Knowledge of contents of specifica-

The foregoing points to one of the important features of a Patent Office, viz., the affording facilities for any person tions of patents in force.

interested to obtain for himself accurate information both as to the contents of the specifications of patents, and as to the patents in force, so as to be able to ascertain of what inventions the use is debarred without the consent of the owners of the patent. The requisites for such information were not made the subject of discussion, but they obviously point to a complete system of indices. It may also be suggested whether it should not be the duty of competent persons in the Patent Office to assist in affording such information so as to render the office advisory and adjuvant to the inventor. The subject of indices was considered, and a resolution passed in reference thereto by the Select Committee of the House of Commons, to the effect that more satisfactory indices and abridgments of specifications should be provided.

Compulsory licenses.

(*h*). It is advisable to establish regulations, according to which the patentee should be compelled, in cases in which the public interest may require it, to allow the use of his invention to all responsible applicants for an adequate compensation.

The foregoing gave rise to a long and animated discussion; the principle of the proposition was opposed by a considerable section of the representatives from the United States and by others who entertained a strong opinion as to the natural rights of the inventor, and who looked upon property in inventions in the same light as property in land or houses. I was said to be inconsistent with what the Congress had already decided in and by the first resolution; that to give a patent and then compulsorily to abstract a part was inconsistent and unjust; that all arrangements of this kind should be left to the parties interested.

Argument for compulsory licenses.

The principle of the proposition was supported by the English representatives with one exception. It was contended in reply to the foregoing objection that even lands and houses were subject to and dealt with compulsorily when the occasion or the interests of a section of the community required it; that all property was the creature of the law, and though the products of the labour of the brain had special claims it ought not to be placed higher than other labour, as giving a title to property. That a patent right was in the nature of a trust to be used for the benefit of others rather than as a property to be dealt with only at the will of the owner, who might act as the "dog in the manger," and for personal reasons neither work the invention himself nor allow any other person to use it. That in almost all countries, except the United Kingdom and the United States, it was required that the invention should be used and worked within one or two years after the grant of the patent, and that the invention should be kept in use as a condition of the validity of the patent, and on pain of its forfeiture. That this was really a working-man's "or an inventor's" question, that it might be for the interest of the capitalist to prevent or obstruct the introduction of a new invention, but such could never be the interest of the inventor. That this condition was calculated to remove the main objection insisted on against patents, viz., that they were obstructive or might be used for the purposes of obstruction. That the leading opponents of patents in England had acquiesced in this as a remedy for the illegitimate use of the powers of the patent, and some of the warmest advocates of the patent system had approved it as removing the only real objection urged against the system, and under the belief that the supposed compulsory powers would rarely be exercised, inasmuch as the existence of the powers would afford a practical cure for the supposed mischief.

Special reference was made to the case of Bessemer's matured invention, and to the possible effect on the trade, supposing one or more important steps in that invention, as, for instance, the tipping vessel, had been made and patented by a stranger, or by one of his own workmen, instead of by himself. The American section of the Congress was urged to give way in favour of the suggested remedy against an illegitimate use of capital which was not felt in the United States, though indication of such a use might be traced in some of the reported litigated cases, and that it could hardly be supposed that in their system, however preferable in some respects to the British, the germ of illegitimate obstruction might not occasionally be developed in a substantial form.

Various modifications of the proposition were attempted. Amongst other amendments it was proposed as follows:—
"That although legislation ought always rather to protect
"the inventor instead of limiting his right, it is expedient
"to adopt measures by which the patentee should in the
"public interest permit suitable persons the use of his
"invention for an adequate consideration, but not before
"the expiration of the first three years of his patent."

Resolution of Select Committee.

The recommendation of the Select Committee of the House of Commons on this subject is as follows:—"That
"all letters patent shall contain the condition that licenses
"be granted by him (the patentee) to competent persons;
"such conditions as well as the fact of competency to be
"determined, in the event of disagreement by the Com-

" missioners, due regard being had in such determination to " the exigencies of foreign competition."*

In considering this question distinction must, it is conceived, be drawn between different classes of inventions, and as to the relative connexion of the subject of the patent with other inventions, as, for instance, whether the subject is a distinct, and, so to speak, isolated invention, like a tool, or a specific apparatus or machine, or whether it is an improvement on or connected with other inventions as one of a series of processes; for instance, the tipping vessel of Bessemer. Regard also, it is conceived, should be had to the competency of the patentee to supply the public demand. The three conditions of the resolution are public interest, suitable applicant, and adequate compensation Cases might be referred to in which the result of litigation has shown that such a compulsory condition would have been most clearly in the interest of the patentee.

Invention progressive.

It must be borne in mind that invention is progressive; that most inventions are but improvements on existing inventions; that each successive inventor may be regarded as having only forestalled time, inasmuch as the invention made by one man to-day would probably, nay almost certainly, have been made by some other person at no very distant period; these considerations, although not detracting from the merit of the inventor, must not be disregarded in determining the duration of the privileges granted by the patent, and the conditions on which they should be enjoyed. By a clause inserted in patents for the United Kingdom, the grantee is bound to supply the public service with patent articles at a reasonable price; this may with good reason and on principle be extended to other cases under a license. The Judicial Committee of the Privy Council on recommending the extension of a patent have required the insertion of clauses regulating the price, and the terms of licenses for compensation to persons interested.

In the result, however, the proposition was accepted in the terms of the preceding paragraph, (*h*), 42 having voted in favour, and 17 against. It should be observed that the foregoing resolution has been thought to be somewhat stronger than as expressed in German; it must, however, be borne in mind that the English version of this resolution is the original and that the German is the translation.

> (*i.*) The non-application of an invention in one country shall not involve the forfeiture of the patent, if the patented invention has been carried into practice at all, and if it has been rendered possible for the in-

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* *See* App. C., *post* 408–410.

habitants of such country to purchase and make use of the invention.

Non-user should not be a forfeiture.

The patents of most countries, except the United Kingdom and the United States, are subject to the condition that the invention should be put in use within that country within one or two years from the date of the grant, and kept in use as a condition of the continuance of the patent. No such condition ever formed part of the law of England, Scotland, or Ireland. The Act of Congress of 1832 rendered obligatory on the patentee the introduction into public use within one year of his invention or discovery in the United States, but this condition was repealed by the Act of 1836, and not re-enacted in any subsequent Act of Congress, and no such condition has been since insisted on. The opinion of inventors was unanimous against any such condition, which was represented as most injurious to their interests, as wholly inefficient, and as leading to various devices for and to cases of scandalous evasion. Instances were cited in which, although large bodies of workmen had been actually engaged in producing hundreds of articles within the country, the proof thereof before the authorities was beset by such insuperable formal difficulties as virtually to destroy or lead to a relinquishment of the patent right.

Resolution of Select Committee.

Reference was also made to the recommendation of the Select Committee of the House of Commons, to the effect that letters patent should contain the condition, " That the " manufacture be carried into effective operation within a " reasonable time by the patentee or his licensees, so as to " supply the demand therefor on reasonable terms." (See App. C.)

This, coupled with the condition as to licenses (also recommended by the Select Committee of the House of Commons) and the above resolution, was thought more likely to meet the object in view, namely the introduction of the manufacture into the country than the conditions usually imposed, by which many inventions are strangled in their birth. Whatever other condition should be adopted the dissatisfaction as to the operation of this condition of forfeiture was universal; no one was found to approve or support it; its abandonment would be necessary if the establishment of any international system of patents is to be agreed upon. The opinion as to the inefficacy of such a condition to secure the establishment of manufactures in any country was equally unanimous.

(*k.*) In all other respects, and particularly as regards the proceedings in the granting of patents, the Congress refers to the English, American, and Belgium patent laws, and to the draft of a patent law prepared for Germany by the society of German engineers.

Several of the main points of difference between the patent laws of England, America, and other countries were referred to; in the course of the discussion a treatise and chart showing these differences by M. Ch. Thirion, of Paris, and other works, were presented to the Congress and referred to.[*]

Features of English system.

Provisional protection.

The main point of difference to be particularly noticed is the feature of the English law, first introduced for the Exhibition of 1851 by the Protection of Inventions Act, 1851, and adopted as part of the patent system by the Act of 1852, whereby provisional protection is given to an inventor from the date of his application for a patent. No such feature exists in any other system.[†] Its importance can only be fully appreciated by reference to the circumstance under which it was introduced, the objects it was proposed to accomplish, and the results which have proceeded from it. Under the old practice application was made for a patent with a title as vague and general as possible; should the invention become disclosed before the patent was actually granted, that is, in the interval between the application and the grant, a period frequently of several months, the patent would be invalid, and convey no rights to the grantee; the patent being granted, the patentee had six months for his specification, into which he might insert anything acquired between the application and the filing of his specification, which could be included in or covered by the title of the patent. The provisional specification, describing the nature of the invention indicated by the title, fixes the applicant to something definite for which the patent is sought; the specification would differ from the provisional specification only in that, in addition to describing the nature of the invention, it would also describe in what manner it was to be performed; the patent when granted would operate from the day of the application so that no other person could intervene, except by *laches* on the part of the applicant.

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[*] *See* the following—App. L., Definite Proposals to Minister of State and for Commerce, for a Patent Law from trading community at Berlin. Dr. Werner Siemens, App. p. 430–438. App. M., Project of a Patent Law, by the Society of General Engineers, App. p. 438–444. App. O., Sketch of a Patent Law for the German Empire. App. P., Report on Patent Laws, Dr. Rosenthall, p. 467–486. App. Q. L'avenir est à l'invention. The prize essay of the District Union of German Engineers at Cologne. App. R., Project for a Patent Law, Klosterman. App. S., Opinion of Mr. Renouard, Member of the Institute of France.

[†] The provision, s. 40, in the Act of Congress 1870, whereby a citizen of the United States on filing a caveat may have notice of an interfering application may be thought to resemble this provisional protection. (*See post* 363 and 369.)

Advantages of provisional specification.

The provisional specification has the further great advantage of affording six months, during which, after the date of the application, the inventor may prosecute in safety his experiments to ascertain in what manner the invention was to be performed, without, as under the old law, having actually incurred the expense of a patent. Further, should he find the first six months inadequate for the perfecting of the means by which his invention is to be carried out, if the invention has not been published in the meantime, or if it has not been put into use, he need not prosecute, but may abandon his application and may make application for another patent, filing another provisional specification, and thus acquire another six months, or twelve months in the whole, for perfecting his invention.

Opportunity for probation.

Now experience has shown this period of probation and trial so to speak to be essential for the inventor. No other country presents this peculiar characteristic of a patent system. In all other countries the applicant presents his specification on application for the patent; his experiments must have been conducted in secret; there is no antecedent period in which trial and probation can with safety take place.

Caveat system of United States.

The necessity for this is so great that in the United States system a caveat may be entered (analogous to an old practice in England) stating what the person entering the caveat has in view; the entry of this caveat entitles the person entering it to notice of any application appearing to interfere with what he is about. Such a caveat is in force for a year; it may be renewed from year to year; but an alien has no such privilege, unless he shall have resided in the United States for one year, and made oath of his intention to become a citizen. The caveat sets forth the design of the invention, its distinguishing characteristics, and prays protection of the right of the inventor until he shall have matured his invention. Upon this caveat the system arises of "interferences," on notice being given to the "caveator" (the person entering the caveat) of a subsequent appearing to conflict with his prior application; upon this interference the question of similarity and of first inventor is decided.

Provisional specification and caveat compared.

In any attempted assimilation of the patent systems of all nations the English provisional specification and American caveat will have to be compared the one with the other; the American caveat is an improvement on the old English caveat in that it affords some information as to the object which the person entering the caveat has in view; but the provisional specification was advisedly and deliberately adopted by the promoters of the new system embodied in the Act of 1852, as preferable to any caveat system, on the following amongst other grounds.

1. It is a record from which the inventor cannot depart as to the nature of the invention for which he contemplates a patent.

2. It is like the caveat a secret document.

3. It gives protection from date of the filing so as to exclude any other person.

Advantages of provisional specification.

4. It affords an adequate period of probation and trial.

5. It recognises the claim of an inventor to be matured into a right.

6. It enables the authorities to preserve the relative claims of rival or conflicting claimants.

7. When published it affords useful knowledge as a guide to subsequent inventors; it is a record of attempts not prosecuted and of failures on particular lines of thought.

If the Law Officer is satisfied as to the sufficiency of this document, he has no option, he must grant his certificate; this attained the inventor in England may be regarded as on the same platform as in America in respect of a recognition of his rights. But the distinction, according to which an English patent is a grant by the grace and favour of the Crown, and not as of right, while an American is of right, founded on a supposed natural and inherent right incident to invention has been much insisted on. The distinction is more ideal than real; it exists in form rather than in substance; in either country the inventor of a new and useful invention obtains a patent as of course.*

Complete specification identical with American system.

Under the Act of 1852, however, an alternative course may be adopted by the applicant, which may be regarded as very similar to the American system; he may file a complete in lieu of a provisional specification, whereby he obtains all the privileges conferred by a patent as of right, the only restriction being that he shall not take proceedings for infringements until the patent is actually issued.

Provisional protection follows as of right on the filing of the complete specification, no certificate of the Law Officer is necessary to confer such protection; the applicant acquires and creates the right at his own will.

Two features of English system.

These two alternative systems, introduced by the Act of 1852, would appear to have received but little attention in other countries; but it is difficult to see in what respect they fall short of the American system in the recognition of the claims of inventors. On the recent inquiry on patents for inventions before the Select Committee of the House of Commons the provisional specification was spoken of by witnesses of every class with unqualified approval. The extension of the period of such protection in certain cases was recommended, so as, amongst other things, to make it available for giving effect to an improved caveat system such as adopted in America. This latter suggestion, however, was not generally approved; it being thought better that an inventor should mature his invention in its general features, and put the same into writing and on record, before obtaining any recognized position for such invention.

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* Reference should be made to a case in which this distinction was insisted on in support of the right of the Crown to use an invention. *See post* 394.

The Report of the Select Committee of the House of Commons contains the following recommendations:—

Recommendation of Select Committee.

"(6.) That protection for a limited period, and dating back to the time at which it is applied for, should only be granted for an invention on its nature and particular points of novelty being clearly described in a provisional specification, and upon the report of a competent authority that such invention, so far as can be ascertained by such authority, is new, and is a manufacture within the meaning of the law."

"(7.) That letters patent ought not to be granted for an invention so protected, until the provisional specification has been open to inspection, nor until a complete specification has been deposited, fully describing the means of carrying it into effect, and such complete specification has been found by the same authority to accord in all essential particulars with the description of the invention in the provisional specification."

"(17*a*.) That protection be not granted to any invention except on the report of a competent person or persons that the conditions of Resolution 6 as to such protection are fulfilled." (See App. C.)

The recommendations contained in the three foregoing resolutions of the Select Committee express the almost unanimous opinion of the many experienced persons examined before the Select Committee, whose labours extended over a greater part of the Sessions of 1871 and 1872. They are in accordance with the principles of the Act of 1852.

Complete specification to be open to inspection.

The Act of 1852 provided (s. 9.) for a copy of the complete specification being open to the public from the time of depositing the same, but was silent as to the time when a copy of the provisional specification should be open to inspection; it enacted (s. 30.) that all complete specifications should be printed and published as soon as conveniently might be after the filing thereof respectively, and that all provisional specifications should be so printed and published as soon as conveniently might be after the expiration of the provisional protection obtained in respect thereof. The Act contained various clauses (s. 11.) for public notice by advertisement in the Gazette of the application, and (s. 12.) for the opposition of persons interested in opposing the same; provisions rendered practically nugatory unless the provisional specification should be open to inspection for the purpose of ascertaining what interests were affected by its contents.

Inspection of provisional specification.

The doubt, existing under the Act of 1852, as to the inspection of the provisional specification was removed by an Act of the next session (16 & 17 Vict. c. 115.; 20th Aug. 1853,) enacting (s. 2.) that—"The Commissioners shall cause "true copies of all provisional specifications left at the office "of the Commissioners, to be open to the inspection of the "public at such times after the date of the record thereof "respectively as the Commissioners shall by their order "from time to time direct."

The noncompliance with this provision by the Commissioners has defeated two of the main objects of the promoters of the Act of 1852; the one the adoption of the complete in preference to the provisional specification,—the other the bringing to bear on an examination system, the aid of persons interested in the manufacture affected by the pending application, or in the language of the Statute, s. 12, "Having an interest in opposing the grant of letters patent "for the said invention," who were to "be at liberty to leave "particulars in writing of their objections to the said application." Effect has not been given to this wholesome provision, notwithstanding numerous memorials addressed to the Commissioners on the subject.

Period of secrecy.

It is not suggested that the provisional specification should, like the complete specification, be open immediately on its deposit; this might interfere with the obtaining of foreign patents, and would deprive the applicant of the advantage of the probation period already referred to (*ante* 362–3) as incident to the provisional specification; but it is suggested that the provisional specification should be open on the applicant giving notice to proceed with his patent, which, according to the existing practice is eight weeks before the expiration of the provisional protection. Under the practice prior to the Act of 1852, *two* months was the period allowed for the specification in case of a patent for England, Ireland, or Scotland only.

Comparison of American caveat and English system.

A comparison may now be instituted between the systems of the American caveat and of the English provisional specification as administered, and as capable of being developed and made available in aid of a system of examination before the patent is granted. In America, as in England, and indeed in all countries, the inventor has no rights, in the strict legal sense of the term, except under the patent actually granted; the legislature of any country might have declared otherwise; an Act of Congress might have declared an inventor to have indefeasible right in his invention, notwithstanding its publication; but it has not done so; on the contrary, legal rights are accorded only after careful examination of the claims of the applicant as true and first inventor of the invention.

Assimilation of the two systems.

In the consideration of the assimilation of the patent systems of different nations it would appear to be a first step to consider the assimilation of the English and American systems; the foregoing suggests an easy mode of accomplishing this.

The principles of law in the two countries are the same; the practice as regards the application, has the same object, viz., affording a period of probation and trial of the invention; a combination of the provisional specification and caveat admits of this; no rights should be actually granted in either country until some description has been filed and placed on record; in this respect the English system as recommended by the Select Committee, and the American system are practically the same.

Under the foregoing circumstances it seems a refinement to be drawing legal distinctions as to which country may recognize the claims of the inventor in the manner most conformable to the assumed rights of man.

Other distinctions.

Other practical distinctions between the systems of the two countries must be noticed. The rights under the patent, when granted, and the principles of law applied thereto, are identical in the two countries. The law and practice of both countries admits of alterations in the patent, after grant, and in the specification after the record of the same, for the correction of errors, or for too extensive a claim, made through inadvertence; subject, however, to the condition that there shall be no extension of the right granted and no alteration so as to confer a right in respect of something not conferred by the original grant. The power of disclaimer, that is, of excising something contained in the patent or specification, exists in the systems of both countries; in England and in America, the power of alteration exists, but it is exercised in a somewhat different manner. In England it is part of and connected with the disclaimer system, and is effected by an alteration in the original document; in America an alteration is effected by a system of surrender and re-issue which, if carefully administered, seems pre-

Disclaimer and amendment.

Re-issue system.

ferable to the English practice; that is a characteristic feature of the American system; nothing like it exists in any other country, and it is considered on high authority to contribute most materially to the efficiency of that system.

French system of addition.

The French system admits of certificates of addition for improvements; they confer the same title as the patent and expire with it. Opinions favourable to the adoption of a similar system in connexion with or as a part of an amended Anglo-American system were expressed at the Congress. Similar opinions have been expressed on many other occasions, and would seem well deserving of consideration as one of the leading features of a patent law of all nations.

Interferences.

The American system of "interferences" deserves special notice; it is designed as a fair and efficient means of trying and determining questions of priority of invention between conflicting and rival claimants for substantially the same invention. A similar system has existed in England from time immemorial under the adjudication and administration of the Law Officers of the Crown, but great objections existed to its working in practice; the provisional specification and the system of examination and opposition contemplated and provided for by the Act of 1852 were designed and are adequate to remove the objections to the working of the system by the Law Officers; the principles of that Act fully administered would deal with "interferences" in a most effectual and satisfactory manner.

A system of dealing with inventions in conflict with each other follows as a matter of course on the examination system contemplated by the Act of 1852, and provided for by the advertisements and notices of opposition. It would be the duty of the examiner to give notice of any application appearing to conflict with a preceding application or with an invention, the subject of an existing patent. Thus the abuse of contemporaneous or of subsequent grants for the same invention would be checked and the competency of the examiner would be tested by the efficiency with which this part of the system was administered.*

The resemblance between this part of the system as contemplated and provided for by the Act of 1852, and the system of interference as administered in the United States is very close; it may be desirable that the attention should be more prominently directed to it.

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* *See* Report as to the Patent Laws of the United States, by Mr. Harriss-Gastrell, in Reports by H.M. Secretaries, &c. on the Law and Practice in Foreign Countries with regard to Inventions. Presented to Parliament, session 1873.

The case of interference arising on the filing of a caveat has been already mentioned (*ante* 363) but if in the course of the official examination before the granting of a patent it should appear that the patent if granted would interfere with any pending application or with any unexpired patent, notice is to be given to the applicant or to the patentee, and the examiner will proceed to determine the question of priority of invention. Cases of interference are regarded by persons of experience as a fair and efficient means of trying and determining questions of priority of invention, and as frequently preventing great waste of time and money.

Terms of patents England and America.

Another feature of difference in the systems of England and America remaining to be mentioned has reference to the term or duration of the grant and the power of extension.

Under the English systems the patent is granted for 14 years, subject to defeasance in the event of certain specified payments not being made before the expiration of the third and seventh years respectively: there is a power of extension for seven or even for fourteen years in cases of highly meritorious inventions, and in which the inventor or his representatives have not, from any fault or laches on their part, been adequately rewarded or remunerated.

Under the American system patents granted since the Act of Congress, 1870, are for 17 years, the power of extension which previously existed having been put an end to, but on what adequate grounds does not appear to be recorded.

Effect of periodical payments.

The system of periodical payments under the Act of 1852 was adopted with a view to, and as a means of extinguishing or causing the lapsing of patents for inventions not actually in use or yielding benefit to their owners. It was thought that as a general rule such increasing periodical payments would not be made in respect of patents yielding nothing to their owners, and that such patents would consequently lapse, and be removed out of the way as an obstruction to further improvements. It was thought also that a patent for an invention, profitable to its owners, was not an improper subject of taxation; that if the first charge for a patent were adjusted to the cost of the system and its legitimate incidents, and limited thereto, any further payments might be regarded as tax on the profits of invention.

Various suggestions have been made for inducing the relinquishment of patent-rights. It has been proposed that instead of fixed annual payments, as adopted in some countries, there should be a scale gradually increasing, but a strong feeling against annual payments was expressed before the Select Committee of the House of Lords, on the Bills of 1851 (which resulted in the Act of 1852), as troublesome and vexatious to inventors, and the Committee advisedly adopted the system of periodical payments, as least onerous and best adapted to attain the end in view.

A strong feeling against annual payments was expressed at the Congress which adopted the resolution already cited in favour of a progressively increasing scale of fees.

Number of patents in England.

The following table will show the working of the system under the Act of 1852, as regards the numbers of applications, the number of patents issued, and the number that lapse on the expiration of third and seventh years respectively:—

Year.	Applications for Patents.	Patents. Sealed.	Paid Duty, £50.	Paid Duty, £100.
1852 - Oct. to Dec.	1,211	914	210	102
1853 - -	3,045	2,187	621	205
1854 - -	2,764	1,878	518	140
1855 - -	2,958	2,046	551	195
1856 - -	3,106	2,094	578	214
1857 - -	3,200	2,028	584	221
1858 - -	3,007	1,954	540	197
1859 - -	3,000	1,977	542	217
1860 - -	3,196	2,063	579	194
1861 - -	3,276	2,047	575	179
1862 - -	3,490	2,191	646	214
1863 - -	3,309	2,094	632	215
1864 - -	3,260	2,024	550	178
1865 - -	3,386	2,186	582	198
1866 - -	3,453	2,124	574	—
1867 - -	3,723	2,284	619	—
1868 - -	3,991	2,490	729	—
1869 - -	3,786	2,407	793	—
1870 - -	3,405	2,180	—	—
1871 - -	3,529	2,376	—	—
1872 - -	3,970	2,771	—	—

America.

The following table will show the number of patents applied for, caveats entered, and patents issued in the United States for the years specified.

Year.	Applications filed.	Caveats.	Patents issued.
1840 - -	765	228	473
1841 - -	847	312	494
1842 - -	761	391	517
1843 - -	819	315	531
1844 - -	1,045	380	502
1845 - -	1,246	452	502
1846 - -	1,272	448	619
1847 - -	1,531	553	572
1848 - -	1,628	607	660

Year.	Applications filed.	Caveats.	Patents issued.
1849 - -	1,955	595	1,070
1850 - -	2,193	602	995
1851 - -	2,258	760	869
1852 - -	2,639	996	1,020
1853 - -	2,673	901	958
1854 - -	3,324	868	1,920
1855 - -	4,435	906	2,024
1856 - -	4,960	1,024	2,502
1857 - -	4,771	1,010	2,910
1858 - -	5,364	934	3,710
1859 - -	6,225	1,097	4,538
1860 - -	7,653	1,084	4,819
1861 - -	4,643	700	3,340
1862 - -	5,038	824	3,521
1863 - -	6,014	787	4,170
1864 - -	6,932	1,063	5,020
1865 - -	10,664	1,937	6,616
1866 - -	15,296	2,723	9,450
1867 - -	21,276	3,597	13,015
1868 - -	20,420	3,705	13,378
1869 - -	19,271	3,624	13,986
1870 - -	19,171	3,273	13,321
1871 - -	19,472	3,366	13,033
1872 - -	18,246	3,090	13,590

A comparison of these tables will enable some conclusion to be drawn as to the effect of the English and American systems in reducing the number of patents.

Patents applied for and lapsing.

About one-third of the applications proceed no further than the first stage of provisional protection; they may be said to die from natural causes. Of the patents actually granted, about seven-tenths lapse at the expiration of the third year, leaving only about three-tenths surviving; nine-tenths lapse at the end of the seventh year, leaving only about one-tenth surviving.* According to this it would appear that not more than about one-tenth of the patents granted are for inventions of sufficient utility to bear the payment at the end of the seventh year. But a certain number of these patents will have lapsed because of other patents being obtained for improvements.

The effect of increasing annual payments in extinguishing or reducing the number of existing patents should be noticed. ~~In Belgium patents are granted for 20~~ years, subject to an annual payment called the annuity tax, which increases by 10 francs annually, that is from 10 francs in the first to

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* The actual numbers, on the average of 10 years ending the 31st of December 1865 (the last year of the second periodical payment) were 3,222 applied for 2,065 granted, 580 making the first and 220 the second periodical payment.

Patents lapsing.

200 francs in the last year. The number of patents granted in Belgium on the average of 10 years from 1854 to 1863 was 1,600; the number of patents paying the tax for the third year was 325, and the number paying the tax for the seventh year was 36. Of 1,028 and 1,788 patents granted in the years 1854 and 1855 respectively, only three paid the tax in the sixteenth year, and not one paid the tax in the seventeenth year.* In other countries, as Austria and Bavaria, increasing annual payments are adopted. Thus it appears that of the patents granted in Belgium (subjected to that annual increasing tax) about eight-tenths lapsed in the third year, leaving only two-tenths or one-fifth surviving; while at the end of the seventh year, not more than one-fiftieth of the number granted were surviving. The comparison is curious, and it would be desirable that the statistics of other countries bearing on the subject should be obtained. The coincidence of the proportion of patents lapsing in the third year in Belgium and in the United Kingdom is remarkable.

In proportion to population.

It would also be desirable to ascertain the number of patents in proportion to the population. The number of patents in the United Kingdom, is about one for every 10,000, and in the United States about one for every 3,000 of the population.

Result of examination in America.

Under the examination system in the United States in the 10 years ending 1852 the average number of patents issued was less than one-half of the patents applied for; in the 10 years ending 1862, the average was about three-fifths; and in the 10 years ending 1872 the average was about one-third, thus showing a generally increasing ratio of the number of patents issued to the number of patents applied for—a fact deserving of special notice.† The effect of the examination as to novelty in reducing the number of patents by one-third is a great gain; but the remaining two-thirds, instead of one-tenth, of the number of patents

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* *See* Report by Mr. J. E. Kennedy Secretary of Legislation at Belgium. Reports on Inventions presented to Parliament, session 1873.

† The following table shows, for three periods of 10 years in the United States, the—

Years.	Applications filed.	Caveats entered.	Patents issued.
1848–52	16,586	5,708	7,840
1853–62	49,086	9,348	30,252
1863–72	155,722	27,165	105,579

granted, continue in force during the entire term of 17 years. The contrast is remarkable, and suggests whether periodical payments might not be adopted beneficially in the patent system of the United States.

Growth of American patent system.

The growth of the patent system in America is very remarkable. By the Constitution of the United States (A.D. 1789) power was given to Congress "to promote the pro-"gress of science and useful arts by securing for unlimited "terms to authors and inventors the exclusive right to their "respective inventions and discoveries," thus adopting the common law of the United Kingdom in respect of the rights of authors, who, prior to the Statute of Anne, had copyright in their works in perpetuity. In accordance with this Article of the Constitution an Act was passed by Congress in 1790, authorising the grant of patents for 14 years for inventions or discoveries deemed sufficiently useful and important; that Act was repealed in 1793 by an Act which defined the subject-matter of a patent to be any useful art, machine manufacture or combination of matter, or any new and useful improvement thereof, not known or used before the application for the patent. In 1836 an Act of Congress was passed repealing all former Acts and establishing a Patent Office and providing for the examination of the alleged new invention or discovery by the Commissioners of Patents, with power of appeal. That Act was the foundation of the present system, which was continued under the Act of 1870, "to revise, consolidate, and amend the statutes "relating to patents and copyright." Under the American system there is now no distinction between citizens and aliens (except as to caveats); there is now no restriction or condition as to place of manufacture.*

The consequences of this legislation have been remarkable. A large number of skilled foreigners have proceeded to the United States, and invention has been stimulated in an extraordinary manner. The applications for patents annually are from 20,000 to 21,000, and the grant of patents from 14,000 on to 15,000. Since 1836 over 140,000 patents have been granted, at least one-half of which are said to have been remunerative; a result of the American, which contrasts most favourably with any other system. Amongst the causes of this extraordinary stimulus to invention, as shown by the number of patents granted, must be noted:

1. The liberality of the system as regards foreigners.

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* By an Act of Congress, 1832, it was obligatory on a patentee to introduce his invention into public use within one year.

2. The cheapness.
3. The security due to the examination system.
4. The diminished litigation owing to that system.
5. The raising of invention into a recognised and respected profession.

Results of American system.

As consequences of this liberality to inventors, the cheapness of patents, and the sense of the security resulting from the examination system, capital is freely embarked in working patents, litigation is diminished, the validity of the patent as to subject-matter or novelty is rarely attacked, and invention has been raised to an accredited and respected profession. The American inventors present at the Vienna Exhibition afforded a striking illustration of this. The superiority they evinced could not be due to scientific education, in which Germany is greatly in advance of America; as a class, inventors from the United States were clear thinking studious men, modest in their claims and pretensions; a result it is conceived mainly due to the respect paid in the United States to the introducers of improvements in labour-saving machines, and to successful labourers in the advancing progress and the gradual triumph of mind over matter.

Belgian system.

Under the Belgian law specially referred to in the foregoing sub-resolution, there are patents of invention, of importation, and of improvement. The patent of invention is granted for 20 years to the inventor who obtains a patent for Belgium before obtaining a patent for any other country; if a patent has been first obtained in any other country the term of the Belgian patent would be the same as the term in that country; thus, if the patent was obtained first in England, the term would be 14 years, and, if first in France, the term would be 15 years. A patent for improvement expires with the original patent on which it is founded. Patents from Belgium are granted without inquiry or examination, the applicant depositing two copies of his specification and drawings relating to the invention; they are subject to an annual payment, and to a condition as to the *exploitation* of the invention within a year of its being worked in any other country. The word *exploiter*, "to work," has been interpreted to construct, use, and vend the invention the subject of the patent; but whether that word is satisfied by the importation of articles from abroad, or whether it is requisite that the invention should be worked within the territorial limits of Belgium, so that the national industry may derive some advantage from the manufacture, is a question left to the discretion of the Government. The Courts of Judicature in Belgium decline all authority in this matter, and assume that the condition as to the working of a patent has been fulfilled, and that the patent is valid until annulled by the Government, which has the credit of acting with commendable liberality in this matter.

Functions of Bureau and of Court of Judicature.

That the determination of the validity or invalidity of a patent on the fulfilment or non-fulfilment of such a condition should be determined by a Government Bureau and not by the ordinary Courts of Judicature is wholly contrary to English and American practice, and to the notions as to the determination of rights in those countries. The Belgian law is not singular in this respect, in Austria-Hungary the Minister of Commerce decides on the validity or invalidity or lapsing of patents; the judicial authorities first deal with questions of infringement, and appeals are finally made to the Minister of Commerce. In certain cases, as of disputed ownership, there may be an application to the Judge of a Civil Court, but the Minister of Trade and Commerce decides all questions of novelty and validity of the patent.

The alteration of this part of the system and its assimilation to that of England or America is greatly desired by inventors.

Draft of law for Germany.

Reference is made in the foregoing resolution to the draft or sketch of a patent law prepared by the Society of German Engineers, prints of which had been distributed to the Congress. (*See* App. *post* 461.) According to this sketch or draft the subject-matter of patents are—

1. Productions of industry;
2. Methods for their production;
3. Machines, utensils, or tools newly discovered or invented without regard to their utility.

Also alterations in the above, provided that they appear to be independent new discoveries or inventions as improvements on the foregoing, either as particular or additional patents.

Such grants, however, are to be subject to the condition that the subject-matter has not been made known by being printed in a European language, or in operation within the German Empire, in such manner as that the invention may be completely carried out by that knowledge. The secret use of an invention is to be no obstacle to its being patented, and the patent authorities are not to be bound officially to direct their attention to proceedings without, that is not within, the boundaries of the German Empire.

Preference is to be given to the first applicant, and patents are to be granted to any subject enjoying the protection of the laws; but foreigners are to choose a domicile within the German Empire, subject to the General Confederation arranging otherwise for reasons of reciprocity. This latter restriction is inconsistent with the principle adopted by the Congress; the suggestions as to the subject-matter and as to publication do not differ from those at present existing in most countries.

The proposed law for the German Empire having been specially referred to as deserving consideration, in framing an international system, it would appear desirable that an assimilation should at once be made in respect of such of the foregoing particulars as present any features of difference.

The communications contained in the Appendix to this Report will show the various views presented to the Congress as to the reform or amendment of the patent system; the points of accord are very numerous; the points of discord or difference are few; without attempting to reconcile these it may be desirable, in furtherance of the objects of the Congress, to present, before concluding this Report, an outline of a scheme suitable as the basis of a patent system of all nations.

Third resolution.

The third resolution submitted to the Congress was as follows:—

III. Considering the great differences in present patent administration, and the altered international commercial relations, the necessity of reform is evident, and it is of pressing moment that Governments should endeavour to bring about an international understanding upon patent protection as soon as possible.

The foregoing gave rise to a discussion on the subject of an international law, in the course of which reference was made to the letter of Mr. Woodcroft, the Superintendent of Specifications in the English Patent Office, read to the Congress by Dr. Haseltine, on a preceding day (*see* App. G., *post* 416, 417) suggesting, in 1856, such an arrangement, as the result of his own considerations and inquiries into the patent systems of other countries. The difficulties in the way of obtaining a law which could be properly called international, as in the case of copyright, were pointed out. The case of copyright is not identical with patent right, inasmuch as the different conditions of different countries as regards the industrial arts might render territorial distinctions as to the term and enjoyment of the patent material to be considered. The better plan would appear to be to assimilate as closely as possible the law, practice and procedure of countries by a system founded on the principles indicated in the resolutions of the Congress, particularly the recognition of the claims of the inventor in all countries by conferring patent protection on the true and first inventor only or his representatives.

The concluding resolutions were as follows :—

Concluding resolutions.

IV. The Congress empowers the Preparatory Committee to continue the work commenced by this first International Congress, and to use all their influence that the principles adopted, be made known as widely as possible and carried into practice.

V. The Committee is likewise authorised to endeavour to bring about an exchange of opinions on the subject, and to call, from time to time, meetings and conferences of the friends of patent protection.

VI. To this end, the preparatory committee is hereby appointed to act as a permanent Executive Committee with power to add other members to their number, and to appoint the time and place for the next meeting of the Congress, in case such a meeting should be considered necessary for the promotion of the foregoing resolutions.

These three concluding resolutions relate to the future proceedings and action of the Congress.

In accordance with the authority thus delegated the Executive Committee met on the following day under the presidency of Baron von Schwarz-Senborn, and took the necessary steps for further proceedings. (*See* Appendix Z.)

Concluding Observations.

Reference was made at the commencement of this report to the provisional protection afforded by the law of Austria-Hungary to any object or objects the subject of a patent or of protection, as a trade-mark or design.

The Austro-Hungarian law applicable to this subject is the law of 15th August 1852, and the laws of 7th December 1858, and the law of 15th June 1865. A treaty of commerce was concluded between Great Britain and Austria, on the 16th of December 1869, by which it was stipulated, " that the subjects of either of the two countries " should enjoy in the dominions of the other, the same pro- " tection as native subjects in regard to the rights of pro- " perty in trade-marks and other signs as well as in patterns " and designs for manufactures." The same law also prohibited the appropriation of the name, firm, arms, or the particular title of the establishment of another inland manufacturer or tradesman in order to mark with them goods intended for sale.

The authority of the law was invoked during the exhibition at Vienna in the following cases :—The one, Atkinson's, " for "the adoption of the name of the firm on bottles of per-"fumery, having on the upper part round the neck the name "'Atkinson'" impressed in the glass, and labelled with the name of the London firm printed on them. Proceedings were taken in two cases against offenders by summons before the magistrate; the offenders were convicted and duly punished, and confiscation of the goods ordered; but in a third case the magistrate declined to interfere, on the ground that the name of the firm (Messrs. Atkinson & Co.) had not been registered under the Austro-Hungarian law of the 7th of December 1858 as a trade-mark. It was contended that this was not the use of the name as a "trade-mark" which required registration, but the fraudulent appropriation of the name of a firm; that the name of a firm does not require registration; that the name of a firm was not a trade-mark, and consequently did not require registration as such under the Act. This decision of the magistrate was affirmed on appeal to the "Statthalterei," the political administrative jurisdiction of the province of Lower Austria.

Proceedings for use of names of firms.

Thus manufacturers were unexpectedly put in the position of either having to register of the name of their firm, as a condition precedent to a right to protection, or of seeing the names of their firms adopted with impunity.

An appeal was heard before the Imperial Minister for Home Affairs who reversed the decisions of the two other tribunals, deciding that "Austrian manufacturers and "tradesmen have no right to make use of the name of any "English firm, although the name of the firm be not "registered in Austria."*

Trade-mark.

In the other case, "Christy's," there had been an unauthorised adoption of a registered trade-mark, and a conviction was obtained, and the piracy stopped.

In both these cases the English manufacturers have expressed themselves as much indebted for their success to the assistance of the staff of the British Commission.†

The distinction existing according to the law of Austria between trade-marks and trade names, registration being necessary for the former but not for the latter, is well founded and consistent with the law and practice in other countries. Each person may be well conceived to have property in his name or in the adopted name of his firm, and to be entitled to prevent any person from fraudulently using it. The name can belong to no one else, but a symbol or a trade-mark first adopted for a special purpose, has no such origin or paternity, and may be reasonably subject to a condition of registration as notice of its appropriation as property. In Great Britain a registration is unnecessary in either case, but it has been often proposed as evidence of property in a trade-mark. It may be observed here that the acquisition or creation of property by and on registration, and the practice of registration as evidence of title and property, are well known in this country in connexion with designs and literary works. It has been proposed to be adopted in connexion with inventions; but, it is desirable that the term should be confined to designs and literary works, the subject of copyright, and should not be extended to inventions. Property by registration is acquired by the simple act of the party.

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* *See* Report by Dr. Weinmann in App. T, *post* p. 514.

† *See* App. pp. 522 and 528.

Registration defined.

Imitative inventions.

The vast collection of machinery from every quarter of the globe at the Vienna Exhibition, afforded many instances in which advantage had been taken of the absence of patent protection. It would be easy, if not invidious, to point out such cases; some might have occurred in ignorance. It may be remarked that in most cases the apparatus was greatly inferior to the apparatus as made by or under the authority of the inventor or his representative. It might in some cases have been copied from the earliest types. Substantial advantage has been supposed to exist in the absence of a patent law, in that the manufacturers of a country are able to adopt the last invention of inventors of other countries, so that by adopting one part from one, and another part from another invention, they may construct a machine as a whole more perfect than the subject of any one patent. But the Vienna Exhibition, although presenting many instances of imitation, appears to have left a general impression in favour of the machines obtained direct from the parent sources.

Inventions built up on patents.

The reaping and other agricultural and the sewing machines might be selected as affording special instances of the way in which inventions are built up on patents; any person experienced in the rapid transmutations which those machines have undergone during the last quarter of a century cannot fail to be struck with the rapid development and progress which capital and skill, under the protection of a patent law, has produced. The best forms of sewing machines have been said by a person well conversant with its history to contain improvements the subject of fifty patents,* and like the best reapers, the best mowers, and other agricultural machines, to owe their existence to the organisation which the patent system has developed in the United States. In that country invention is regarded as a recognised profession, and no one conversant with its progress can doubt as to that being mainly due to its system of patents. The testimony as to the effects and working of the American system cannot be doubted; all the witnesses concur in the opinion that there is greater security and less litigation as to this property than in any other country, and that this is due to the examination system. The litigation which does take place in the United States, and which is no doubt considerable, has reference generally to questions of infringement and damages, and not to novelty; such litigation may be expected to decrease as the examination system is rendered more efficient.

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* *See* evidence of Mr. L. E. Chittendon before Select Committee of House of Commons on Patents for Inventions, 6th July 1871.

Invention promoted by patents.

The effect of that system in the reduction of the number of patents issued as compared to the number applied for, has been already observed on (*ante*, p. 371); its effect on saving the applicant from his own ignorance and from the loss of his time and money should not be omitted. An idea, like history, repeats itself; hence it may be expected that in the records of the Patent Office will be found the same idea recorded, and frequently very similar means suggested; but the invention was before its time and failed for want of practical development.* An examination system secures to the inventor the accumulated experience of the Patent Office; it warns him of the pitfalls into which others have fallen and although it may not indicate the course in which invention should go it may indicate the path in which it should not go.

Reduction of patents by examination.

In addition to all this it affects a money saving to the inventor of the most substantial character. Suppose that an examination system should prevent the granting of one moiety of the patents now granted in the United Kingdom; this is the proportion which the practice in the United States suggests would be the result. There would be a saving to the inventors in fees alone of some 20*l.* in a year, in addition to other charges, making a great total, inclusive of the time and labour of the inventor, of not less than 50,000*l.* a year. Such consequences as these cannot be disregarded and ignored.

Money gained to inventors.

Intimately connected with and forming part of the patent system is a Museum of Industrial Arts. It is not suggested that an attempt should be made to collect and preserve models of all inventions; such a collection would soon be-

Museum of industrial Arts.

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* A remarkable instance of this has recently occurred in reference to the sewing machine. In the specification of a patent for boots and shoes (Saint's, 17 July 1790) is found a machine for making a stitch.

come useless lumber; but it is suggested that selected specimens, illustrative of the progress and state of invention, should form a museum, arranged in classes according to subjects, with suitable courses of lectures thereon.*

Deposit of models.

In the United States the Commissioners of Patents may require the deposit of models in certain cases, and it is well worth considering whether this should not form part of the international or assimilated law of patents, which it was a main object of the Vienna Congress and of the subsequent proceedings of the Executive Committee to promote. (App. Z.)

Educational establishment.

Such an examination of inventions for which patents are applied for, and a museum of industrial arts would form part of a great educational establishment for technical instruction. Let it also be borne in mind that the patent system in the United Kingdom and in the United States is more than self-supporting. The fact should never be lost sight of that since the 1st of October 1852, the date of the commencement of the patent system, established by the Patent Law Amendment Act, 1852, the total amount of the funds contributed by inventors in respect of patents to the 31st day of December 1872, is upwards of 2,000,000*l.*, and the aggregate surplus of receipts over expenditure for the same period is 1,012,928*l.*; the surplus of income over expenditure for the year ending 31st December 1872 being 85,611*l.* 1*s.* 9*d.*†

Patent system self-supporting.

The surplus of the charges on patents above the expenditure of the Patent Office in the United States for the year ending the 31st of December 1873 was 691,178 dollars, or upwards of 17,000*l.* sterling. That the patent system should be self-supporting may be conceded; this being secured it may be asserted in the language of Earl Derby (writing as Lord Stanley in 1856), "that the taxing of in-
" ventions is an experiment never contemplated by the
" framers of the Act of 1852, and unjustifiable even in the
" utmost pressure of financial distress. I venture, therefore,
" to demand that this tax should cease, or that patent office
" fees should henceforth be applicable only for patent office
" purposes. When once the treasury ceases to have an in-
" terest in the amount of fees collected, the question, what
" these fees shall be, and under what limitations it may be
" expedient to bring them, will present fewer difficulties."

The cost of the administration of the system in the United Kingdom cannot be said to have been ascertained, so long as the necessary buildings for a suitable Patent Office and Library, and for a Museum of the Industrial Arts, the system of examination, and the preparation and publication of comprehensive indices, and of a history of inventions, remains in abeyance, and the cost thereof is unascertained.

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* *See* Report and Recommendations of Select Committee of the House of Commons, presided over by Mr. Dillwyn on the Patent Office Library and Museum, 1864, *post*, 392, 393.

† *See* App. K. p. 430.

Reduction of cost and examination.

It has been said, and with good reason, that a reduction of the cost of patents to a minimum and an examination system should go together. The benefit of this to the poorer inventor cannot be too highly estimated. An examination is clearly in his interest as protecting him against his ignorance, as pointing out on authority the practical course of invention, as saving his labour, time, and money, and as giving value and security to his patent when granted. Reference has been made to the complaints of the examination system in the United States. As already observed (*ante p.* 372) the refusal of one-third (in some years one-half) of the patents applied for must of necessity lead to many complaints, however many may acquiesce in the rejection; but it is stated on high authority that "the "complaints against the patent system of the United States "arises almost exclusively in respect of patents that are im"properly granted, because of the want of proper supervision "in their examination."*

Subject of grant should be well defined.

To the arguments already referred to in support of an examination by competent persons may be added the consideration that if the granting of patents, as alleged by the opponents, be an infraction on the free domain of knowledge, it is right that every means should be taken to define, limit, and make certain, that from which the public are excluded for the limited period of the term of the grant; that this involves an amount of knowledge which the inventor cannot possess or procure for himself, and which the accumulated experience of an official staff can alone provide. A patent so limited is the most valuable to the inventor, the least restrictive on manufactures and trades, and freest from annoyance to the public. The security thus given by a system of examination is the only explanation of the fact, also stated on high authority, that nine-tenths of all the capital invested, in manufacturing in the United States is thus invested because of the security to it given by patents, inasmuch as very few men are willing to invest their money in manufacturing, if, when they have established a market and rendered their articles of manufacture popular, other establishments may be built up in their immediate vicinity, compete with them in the market and reap the advantage of their pioneer work.†

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* *See* Report of Commissioner Leggett to Congress for the year 1873.

† *See ibid.*, also address of Hon. J. M. Thacher, App. *post* p. 417.

Before bringing this report to a conclusion it will be proper to consider in what manner, and to what extent the programme on which the Patent Congress was founded has been carried out, and the anticipation of its promoters realised.

Programme how carried out.

That programme called attention to the controversy of very recent origin as to the policy of any patent system, regard being had to the principles of free trade and their general adoption,—to the adoption of a very liberal customs policy,—to the results of inter-communication in uniting isolated seats of industry,—to the interchange of materials and commodities between nations,—to the consequences of unrestricted competition with countries having no patent protection,—to the attraction to and concentration of skilled labour in countries having such protection,—to the duty devolved upon those who supported the system to remove the doubts and scruples, as to the practicability and economical utility of such protection, and then to endeavour to effect a transformation of the existing laws to some uniform system. (*Ante* pp. 338, 339, and App. A.)

Free trade.

True monopoly.

To the observations already made on the subject of the connexion between free trade and patent right it may be farther suggested whether the term free trade and protection in the sense in which they are now applied by political economists can be properly applied to the patent system. By free trade it is understood that everyone shall have the free disposal of that which he has lawfully acquired without detriment to or interference with the rights of others. Thus free trade means simply free interchange between nations contributing to the advantage and wealth of all; this benefit arises from and involves no sacrifice on the part of one nation for the profit of another, on the contrary the sum of the productive power of man is by these means, and without increased labour, largely augmented throughout the world, an increment due partly to the suppression of ignorance and fraud, and partly to the united efforts of skill and science in compelling nature to minister to the wants of man. Patent right or protection, for, or property in, inventions comes in aid of this compulsion by stimulating invention under the guarantee of payment for labour expended and for services rendered. Such property is only a monopoly in that sense of that term in which all property may be said to be a monopoly. The misapplication of this term monopoly, or the misapprehension of its true meaning, is the real cause of the conception that patent right or property in inventions is inconsistent with free trade; on the contrary, free trade is an essential preliminary condition of a rational system of protection of inventions on a free basis. Free trade is the right of individual enterprise in dealing with those things which are common to all without impositions or restrictions for the supposed benefit of nations or of individuals. Free trade and the protection of inventions or patent right stand in precisely the same relation to each other as freedom of the press and copyright.*

Protection.

In contrast with "free trade" is "protection," which it is the triumph of the principles of free trade to extinguish. Here again the misapplication of terms creates confusion. In one sense the term protection means imposition of fiscal dues, in another sense it means property; these customs are an instance of protection which have no reference to rights of property, but protection to inventions means protection of the property in invention, without which protection the name of property is an empty sound.

The conclusion to be drawn from the foregoing is that patent right or property in inventions in no way conflicts with the principles of free trade.

Nor do such rights enhance prices so as to affect the freedom of interchange of commodities in the way in which such interchange is interfered with by fiscal impositions as customs "dues."

The evidence of experience establishes the fact that the effect of invention is either to reduce the price or to improve the quality, and frequently both. The reduction in price is the real motive element. If the article be not cheaper the public will generally pay little regard to the quality, and will go on buying the old article. So that it is difficult to conceive in what way any patent system can affect that free competition in the interchange of commodities which intercommunication has a tendency to promote. Another fact is that the country, the parent of the invention, generally commands the markets of the world, and that the advantage of countries being free to adopt the inventions of the world is more imaginary than real, and not sufficient to command neutral markets. The object of patent laws being to create a trade which, when created and established, should be free, the principles and effect of such laws are in full accord with the principles of free trade, as already observed. So it may be concluded that patent laws in no way interfere with that competition in commodities the subject of trade. In connexion with this part of the question it must not be over-

Patents in accord with principles of free trade.

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* *See post*, p. 479 of App. P.

looked that the inventor and his associates are the individuals most interested and most likely to succeed in forcing the new invention on an unwilling recipient (*ante*, p. 344). On this may be founded one of the politico-economic arguments in favour of the patent being granted only to the inventor or his representatives, and in favour of an international system of patents; so that the rights accorded to the inventor may be as world-wide as the laws on which invention is founded.

Industrial art in Switzerland and in Germany.

The state of the industrial arts in Switzerland and Germany may be referred to in illustration of the question as to whether the absence of a patent law is beneficial or otherwise to a country. In the greater part of Switzerland there is nothing in the nature of a patent law, nothing to check the establishment of any industrial art, the subject of patent protection in other countries, and yet there is no evidence of that vigour of manufacturing enterprise which such freedom from restriction is supposed to develop.* The Swiss products of industry require manual skill and dexterity, such as exhibited in watchmaking, no inconsiderable portion of which is done by women and children. Inventive talent, such as possessed by Bodmer, a Swiss, or by Heilman, a German, or by Siemens, a Prussian, found its way to England from their own countries. Of this migration of inventive talent and of skilled labour to other countries no doubt whatever can exist.

The following passage from the Report of Dr. Rosenthall (App. P. *post*, p. 481), may here be cited :—" Have not our " German inventions, telegraphy, telegraphic printing, ce- " ment, steel manufacture, aniline colours, been taken to " foreign countries in search of the capital necessary for " their development. Every German capitalist is afraid to " lay out the preliminary amount required for experiments, " construction, models, &c. if he is not sure of his property " afterwards."

Another publication† contains the following passage :— " The fact that Germany has the smallest number of patents " of all civilised countries cannot unhappily be disputed." Then, after reference to the evidence of this fact afforded by the technical journals, "it will not be disputed that these " figures furnish matter for serious reflection; they show " that the demand for new inventions in Germany is scarcely

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* *See* Report by Dr. Rosenthall, App. P., *post*, p. 481.

† The Prize Essay of the District Union of German Engineers, App. Q., *post*, p. 494.

Effect of want of patent system in Germany.

“ covered to the extent of from 10 to 20 per cent. by the “ Germans themselves. Now seeing that the inventive “ capacity of the Germans has been long since on record “ most unmistakeably and prominently, and is daily exem- “ plified in foreign countries, this phenomenon can only be “ explained by the inadequate protection afforded to inven- “ tions in Germany paralysing the efforts of the inventor.” Again, “if the protection of inventions does not promote “ inventive activity, it must impede it or be without in- “ fluence upon it. The assertion that it is without influence “ has never yet been made, and we can therefore pass that “ over. But if protection had the effect of impeding inventive “ activity, then the countries in which it does not exist, such “ as Holland and Switzerland, must be especially distinguished “ for inventions.* Experience teaches that those countries in “ which the protection of inventions is liberally maintained “ and energetically managed have the greatest number of in- “ ventions to show, and that on the contrary those countries “ in which there is no, or inadequate, protection produce the “ fewest inventions. If you acknowledge a causative con- “ nexion to these facts you cannot avoid the consequence of “ acknowledging that the protection of inventions is necessary “ for the interests of the community.” To the foregoing may be added the fact that of patents issued in the United States to foreigners, by far the largest proportion are issued to Germans; thus confirming the conclusion as to cause of the small amount of inventions, and as to the difficulty of introducing new inventions, in Germany.†

Patents consistent with free trade.

Upon this and other considerations most fully set out in the reports already referred to and printed in the Appendix, it is conceived that patent protection is not inconsistent with the principles of free trade, but that, as rightly considered, it is based on those very principles; that it tends to promote the interchange of commodities, and is an effective check on the attraction to and concentration of skilled labour in countries having a national system of patents.

Decision of Congress.

The response of the Congress on the question of abolition or maintenance having been so unequivocally expressed in favour of the proposition “that the protection of inventions “ should be guaranteed by the laws of all civilized nations,” must be followed, as suggested in the programme, by “ the “ endeavour to effect a uniform transformation of the existing “ laws of patents, which is now as various as it is complicated ” (App. A., p. 400). The programme also suggests that such reform should not be restricted within territorial limits, but that steps should be taken for obtaining an international patent law, or a patent law of all nations.

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* *See* facts stated as to these countries, *ibid*, p. 494.

† *Ibid*, p. 494.

Patent systems of different countries.

The leading distinctions between the patent system of the different countries have been already adverted to, subject to the observation that the principles of the laws of all countries as recognising the true and first inventor, and as to novelty, are the same, but that some countries do not recognise the claim of the true and first inventor exclusively, and that some differences exist as to what constitutes novelty, and the publication which will defeat it.

Existing laws have also been already divided into two classes,—

1. Those in which the patent is granted as of course, if the formal procedure be complied with, and which has been called the proclamation system.

2. Those in which the patent is granted upon and after previous inquiry, which has been called the examination system; the principal distinctions between those systems have been pointed out.

In addition to the foregoing distinctions it will be desirable to point out the variations in the systems under the following classification, in order that the precise nature of the differences in the systems of each country may be prominent, and the attention which will have to be made, both as to their nature and extent, may distinctly appear. The condition that the patent should not be granted except to the inventor does not at present exist in Belgium, France, Norway, Paraguay, Poland, Russia, Sweden.

In each of these countries the patent is granted to the first applicant; in some of them, however, as Norway, Sweden, Poland and Russia, the patent is not granted except on an examination as to novelty and utility.

2. In the following countries a patent is granted to the inventor only:—

Austria, Baden (Grand Duchy), Bavaria, German States (smaller), Hanover, Italy, Portugal, Roman States.

3. Patents are granted to the first importer without reference to his being the inventor in the countries following:—

Brazil, Chili, Peru, and New Granada, Denmark, Holland, Prussia, Rio da Plata, Saxony, Spain, Wurtemburg.

The policy of these countries is to encourage the introduction of new inventions without regard to the claims of the inventor.

4. In the United Kingdom the claims of the importer are recognised; an oath, or solemn declaration, is required to the

effect that the applicant believes himself to be the inventor, but in the United Kingdom, an importer from abroad is regarded as the inventor within the realm, so that there is nothing to prevent the illegitimate system of pillage of which complaint has been made.

In the United States a similar oath or affirmation is required and the patent is valid, although the invention may have been known and used in a foreign country, but not patented or described in a printed publication.

The effect of prior publication in another country is differently regarded by the laws of the foregoing countries. It is not necessary, however, to pursue the subject further, inasmuch as it is considered that, if an international or universal system be established, it must be based on a recognition of the inventor or his representatives to the exclusion of strangers to the inventor.

This principle being recognised other matters as to the manner of granting patents, their cost, term, and conditions as to working licenses, or prices of the commodities, may be left to each country according to its exigencies.

In furtherance of the views of the promoters of the resolutions of Congress, it may be right to refer to the different systems proposed, and existing, as introductory to the suggestion of a system for all nations.

Three systems proposed.

Systems as proposed or existing may be divided as follows:—

1. A registration system.
2. A proclamation system.
3. An examination system.

The registration system might be disposed of at once, as non-existent in practice, were it not for the authority with which it was proposed and the analogy which is afforded by registration in cases of copyright, of designs, and trade-marks as in Austria and some other countries. The first effective movement for the reform of the patent laws was inaugurated in 1849-50, by a very influential committee of the Society of Arts; the result of which was a proposal for the registration of patents similar to the registration of designs, in fact to make the law of patents and designs substantially the same. The opposition which this proposal evoked was founded on the substantial differences between the two cases. Designs had reference to the fine and ornamental rather than to the industrial arts, except in the limited instances of designs for utility, most of which are properly the subject of patent. The substantial distinction existing betwixt the two, however, will be evident on the consideration that a design is in all cases capable of being represented by two dimensions, as by a plan or projection on the surface of paper, whereas an invention in the industrial arts involves matter, its forms and properties, the action of forces chemical, electrical, and mechanical. Again a design, like a book or pictures, is the type of the particular mind producing it, no other person would produce identically the same except in a very few and simple cases; whereas the same identical invention may be hit upon by different minds, so that it has been assumed, not without reason, that an invention if not made to-day by one person would probably be made to-morrow or shortly afterwards by another. The mechanical laws and theoretical knowledge may be common property, but the skill for adaptation essential to invention has not been brought to bear upon the particular subject. For it can never be too frequently or too forcibly insisted on that ideas do not constitute invention, they must be embodied in some material form, just as other ideas of the mind must be embodied in writing before they become the subject of property that can be defined or transmitted. The embodiment of such ideas constitute the labour of invention, the service rendered, which ought to be paid for and remunerated as such.* The history of most inventions will show how often the parent idea has been suggested and made the subject of patents, but nothing then came of it, the suggestion being before the time or the suggester having failed in the skill of adaptation to practice, or in the perseverance and pertinacity which altogether constitute the labour of invention.†

Skill for adaptation.

The promulgation of immature inventions is injurious equally to the cause of invention and to the inventor. A system of simple registration would foster rather than check such precocity. Such a system, proposed by friends in the interest of the patent system, was supported by its opponents as the most certain means of bringing it to an end.‡ Property in invention, as in land, may be too much subdivided to be profitable. Such visionary or immature applications have been proposed to be checked by a high charge for patents, but the true check would appear to be a well regulated system of examination, before the patent creating the property is granted.

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* *See* opinion of M. Renouard, App. S. *post*, p. 511.

† The case of Sir F. Ronalds and Telegraphs deserves to be recorded; he had invented an electric telegraph constructed with several miles of wire in his garden at Hammersmith. He submitted his invention to the Admiralty, but was told that the existing semaphore was quite sufficient for the purpose.

‡ *See* evidence of I. K. Brunel before Select Committee of House of Lords, session 1851.

Proclamation and examination systems.

The two other, the proclamation and the examination systems, represent the existing systems, as to which it may be observed that the proclamation system is supposed to include the systems of all those countries in which, if the documents on which the application is founded be not informal, the patent issues as of course and the grant or concession proclaimed by the State or by the grantee as having so issued. The examination system is supposed to apply to all these cases in which there is an actual examination, as in the United States, or a supposed examination with opportunity of opposition, as in the United Kingdom. Although in the latter case the system is so imperfectly and inadequately carried out as to be practically non-existent for any effective purposes, the opportunity for opposition exists upon which the patent may be stopped. That system cannot then be designated by either of the terms registration or proclamation, and inasmuch as an examination by the Law Officer does exist in some cases, and may exist in all, that system should be classed under the examination system.

Suggested law for all nations.

The Vienna Patent Congress having recommended an examination system, the suggestion now made as to a law suitable for all nations will be founded thereon.

It is suggested, then, as follows:—

1. The application to be by or on behalf of the inventor, and to be founded on a document in the nature of a provisional specification, upon which provisional protection for a limited period should be accorded, enabling experiments to be conducted without prejudice to the issue of the patent.

2. The applicant, being the inventor or his representative, to have the alternative of filing a complete specification in the first instance, under which there should be provisional protection for a like period.

3. The provisional or complete specification, as the case may be, to be referred to competent persons for the preparation of indices, and for examination and report as to the sufficiency of the specification on its face, and as to the novelty of the invention disclosed.

4. Such report to be submitted to the officers entrusted with authority as to the granting of patents.

5. Upon such report, if not unfavourable, the patent to proceed, but if unfavourable, the applicant to have notice and to be heard before such officer assisted by the examiner as an assessor; but no communication to take place between the applicant and the examiner, except on such hearing.

6. The provisional or complete specification to be secret, but before actual issue of patent to be open to inspection

so as to give parties interested an opportunity of opposing before the officer. The costs occasioned to the applicant by such opposition, except in cases of fraud or misconduct, to be paid by the Patent Office.

7. An appeal from the decision of such officer in all cases to some tribunal as one of the ordinary tribunals of the country.

8. The specifications to be printed and published on the issuing of the patent.

9. The patent to be for 15 years, and subject to periodical payments at the end of the 5th and 10th years respectively.

10. Power of extension for 7 years.

11. Disclaimer of parts of title or specification.

12. Re-issue of patents so as to admit of additions, amendment and consolidation of patents for successive improvements relating to the same subject.

13. First cost of a patent to be adjusted according to the cost of the system; the periodical payments to be on an ascending scale.

14. Transfer of patents, licenses, and other interests, if any, respecting patents to be registered at the Patent Office.

15. The patents to be subject to a condition for licenses, and to such other conditions as the exigency of the country may seem to require.

16. Litigation to be heard before a judge of the ordinary tribunals, with assessors, and without a jury, except in very special cases of disputed fact, subject to appeal as in other cases.

Suggested system for all nations.

17. Power to require the deposit of a model, of specified size and scale, before the issue of the patent, the cost of such models to be borne by the Patent Office.

18. Such models to be preserved in a Museum of the Industry of all Nations, in which inventions are arranged and classified with a view to the requirements of the Patent Office, a history of inventions, and technical instruction.

19. A free Library and free Museum, with every facility of reference, to be provided in the principal towns of each kingdom.

20. The proceeds of the cost of, and periodical payments on, patents to be applied to the administration of the system, to the printing and publication of specifications, abridgments, indices, a history of inventions, and the establishment and maintenance of free libraries and museums.

The system of which the outlines are suggested above is founded on the recognition of the claims of the inventor and an examination of the invention; such an examination to be limited to novelty and to precision of description. The expression of any opinion as to the merit of the inventor, or practicability or utility of the invention, is to be excluded; that must rest on the sole responsibility of the applicant and his advisers. The applicant having been warned by persons best competent to inform him as to the manner in which he may appear to have been anticipated in the line of invention, will be in a position to judge, by himself or his advisers, as to expediency of prosecuting his application by appeal in case of an adverse decision.

Thus the inquiry is limited to matter of fact; to the question of novelty; and matters of opinion as to practicability or utility are excluded and left to the judgment of the applicant. Such a system would practically be advisory and adjuvant rather than prohibitory. Much may be said in favour of the patent being allowed to issue, should the applicant so warned and after appeal insist upon it, the reports against the patent being on record against it; but, looking to the fact that the inclination of the ultimate tribunal would be to grant the patent in any case of doubt, it is thought that on an inquiry so limited, it is on the whole, better that the power of absolute refusal should exist.

Suggested joint commission or convention.

An examination having taken place, either in the United Kingdom or in the United States, it could hardly be necessary to repeat it on the application for a patent in another country for the same invention by the inventor or his representative; it may be further suggested whether something in the nature of a joint Commission or a Convention might not exist in which, on an application for a patent in another country, some member or representative of the country in which the patent was first granted might take part, and which might be a court of appeal in certain cases.

Select Committees, 1851 and 1864.

The inquiry before the Select Committee of the House of Lords in 1851 resulted in the Act of 1852, the peculiar feature of which, provisional protection, has been already referred to.

The Select Committee of the House of Commons, presided over by Mr. Dillwyn, reported as to a museum of mechanical inventions to the following effect:* "That the "chief purposes of a general museum is to illustrate and "explain the commencement, progress, and present position "of the most important branches of mechanical invention;

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* *See* Report, 19th July 1864.

" to show the chief steps by which the most remarkable " machines have reached their present degree of excel- " lence; to convey useful and interesting information to " stimulate invention." Also, " in forming an illustrative " collection, it would be necessary to adopt the principle of " selection. Such a collection should contain a selection " of models of moderate size, which should illustrate dif- " ferent departments of inventions, and also a selection " of models of current patented inventions. This collec- " tion should be exhibited in connexion with the Patent " Office."*

Report of Royal Commission.

The Royal Commission appointed to enquire into the working of the Law of Patents for inventions, presided over by the present Earl of Derby (as Lord Stanley) in 1863–5, state in their report, as follows, as to the subjects of preliminary examination, and the tribunal for patent litigation, as follows:—" Your Commissioners are unable to recommend " a preliminary investigation into the merits of the invention " for which a patent is claimed, but they advise that a " careful inquiry be instituted under the direction of the " law officers of the Crown as to whether there has been " any previous documentary publication of the inventions " either by grant of letters patent, or otherwise, and if " such publication have taken place, that the patent shall be " refused. No evidence other than such documentary evi- " dence should be admissible, and the reasons for the refusal " to grant the patent, should be certified by the law " officers; an appeal from their decision should lie to the " Lord Chancellor. Your Commissioners are of opinion " that the present mode of trying the validity of patents is " not conducted in a satisfactory manner. That such trials " ought to take place before a judge sitting with the aid of " scientific assessors, but without a jury, unless at the desire " of both parties to the suit or action. That such assessors " ought to be selected by the Judge in each case, and the " remuneration to be paid them be included in the costs of " the suit or action, and provided for in such manner as " the Judge shall direct. That no special Judge be ap- " pointed for the trial of patent cases, but that the Judges " of law and equity be empowered to make rules by which " one court should sit for trial of Patent causes exclusively."

Select Committee, 1872.

The Select Committee of the House of Commons appointed to inquire into the law and effect of grants of letters patent for inventions, presided over by Mr. Samuelson, recommends a preliminary examination as to novelty, and that the trials of patent causes should be before a Judge, assisted by skilled assessors.*

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* *See* Report, 19th July 1864, on Patent Office Library and Museum.

† *See* Report of Royal Commission, 1865.

The weight of authority and experience of the United States as to an examination system is so great that it may with confidence be expected to be adopted in any assimilation of the patent system of all nations.

The Royal Commission was of opinion that licenses to use patented inventions ought not to be compulsory, but that the Crown should have the power to use the invention, subject to payment; that a patent ought not to be granted to the importer of a foreign invention, and that there should be no extension of the term of a patent beyond the original term of 14 years.

Compulsory licenses.

The resolution affirming the principle of compulsory licenses was a generous acquiescence on the part of many who viewed it as an infraction on rights of property, but as already stated, as specially pointed out at the Congress, cases may occur in which a subsequent invention may contribute materially to the prior invention, may conduce to its higher degree of perfection, though not essential to its practicability. Another class of cases is the public service, as the construction of vessels and muniments of war, in which trial must be made on the largest scale, and in which the conflict of rival claimants may materially interfere with the adoption of the most perfect plan. The inconvenience resulting from this has been found so great in the public service in Great Britain that advantage has been taken of a fiction of the law, whereby the sovereign power in each State is supposed to be the general owner of all property, and that as such must be presumed in making the grant of a patent not to do anything in derogation of its own rights, but to reserve to itself the power of using any invention it may think fit, notwithstanding the grant of exclusive privileges in respect of it to another.† It should, however, be mentioned that the patents as granted have for many years been subject to a condition avoiding the grant if the grantee shall not supply for the public service, all such articles as he may be required to supply in such manner, at such time, and at such reasonable prices and terms as may be settled by the officers of the Ordnance Department; also that notwithstanding this assertion of right on the part of the Crown, compensation has usually been paid to the owner of the patent.

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* *See* Report, in App., *post*, 408–410.

† *See* the case of Feather, suppliant, *v.* The Queen, 6 Best & Smith, 257.

Protection to the inventor.

In addition to the reasons already given in support of the licensing clause, and which, as already stated, was supported in the interest of the inventor as against the capitalist and manufacturer, whose interest, it may be, that the invention should not be brought into use, the clause may be supported in the interest of the inventor as a protection against himself. Many inventions are inadequately worked by the inventor; personal considerations frequently intervene to prevent the granting of licenses; litigation ensues, which, after a large expenditure on both sides, generally results in a settlement on reasonable terms if the patent is sustained. Litigation is generally a means for attaining terms which might have been obtained by arbitration, to the benefit of both parties. The existence of such a power as a *vis major*, will it is believed, constrain all parties to be reasonable and render litigation, except in some cases of infringement, wholly unnecessary.

Injurious to inventor.

It was objected that a system of compulsory license might be injurious and unjust to the inventor, inasmuch as a capitalist or manufacturer might procure a license and extinguish his patent; but this could only be done if the license were sole and exclusive, the granting of which would be wholly inconsistent with all the principles upon which compulsory licenses are advocated.

Again, it has been said that supposing one of two rival manufacturers to have improved and cheapened a mode of production by great skill and the outlay of capital, is his rival to come to him and deprive him of the benefit. To this it may be replied that such a case would not be within the resolution. Why is it to be supposed that a competent tribunal in case of disagreement would not take care that the grantee of a license was a suitable person and that the inventor obtained adequate compensation? Suggestions that licenses should not be asked for until some years after the grant of the patent, and should be subject to periodic revision are well deserving of consideration.

Classes of inventions.

Man has not been unaptly described as a "tool-making animal." His earliest contrivances to support life were tools of the rudest and simplest construction, his latest achievement are still in the same direction, the substitution of mechanical for manual labour; hence it has been found convenient to describe certain classes of inventions as tools though actually machines, as the self-acting planing machine of Whitworth, and generally that large class of inventions described as labour-saving machines. 'The progress of the nation will materially depend on the progress of invention, to it the rapid creation of wealth is mainly due. The fine arts add to the amenities of life, to the civilisation of the nation, but the industrial arts add also to the comforts of life and to the wealth of the nation. It is said that necessity is the mother of invention, but if necessity be the mother, its father is human industry directed by scientific and technical knowledge.

Technical instruction in Germany not taken advantage of.

While the advanced position of technical instruction in Germany over other countries is conceded, it is not denied that it lags behind in the industrial arts. One cause of this, namely, inadequate protection to invention has been pointed out (*ante* 369). A contrast with the United States may not be out of place. In that country education is widely disseminated; the education of all is the great and essential first step, the next step is technical instruction; special teaching adapted to the capacity and proclivities of the youth is carried on to a much greater extent in Germany than in the United States, but the effect there on the intelligence of the rising generation is thus described by a most competent judge who says, "An American youth helps his employer "by reason of his thoroughly understanding the charge "that is needed, and helping on the road to it by readily "attaining to any new knowledge instead of stopping his "employer on the road, putting his own ignorance in the "way of the employer's knowledge, standing in the middle "of his path and exhausting him in the efforts which he "is forced to make to get past."* The contrast thus presented may suggest various reflections as to causes and consequences which cannot now be followed out. The collection at the Vienna Exhibition afforded many illustrations of the differences in the industrial progress of the nations of the world. An unprejudiced examination would probably lead to the conclusion that no one nation had any great reason to exult over another; that the knowledge of applied science and practical art had extended widely and is rapidly extending in every direction; that there are heads to plan and hands to execute pretty uniformly distributed throughout the civilised and habitable parts of the globe; that the knowledge of the industrial arts is so widely extended and extending that competition will hereafter depend more on local advantages than on the special fitness of those of any particular locality or nation for different operations. The human mind and human skill present wonderful power of

Effect of free trade.

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* *See* evidence of A. Field before Commission on Scientific Instruction, 25th June 1868.

adaptation; the power of mind and matter are one and the same throughout the globe; the transition from manual to mechanical operations, and the adoption of labour-saving machines, has a gradual, though slow, but steady progress, which expositions of industry cannot fail to accelerate beyond natural causes. Free trade, the great civiliser of mankind, is promoted by such expositions; the deep-rooted prejudices of the natural instinct of man vanish before the knowledge that interchange of commodities may take place in which each party to the transaction is the gainer; that such gain is the true nature of profit; that free and unrestricted interchange of commodities between nations contributes to the advantage and wealth of all; that this benefit arises from no sacrifice on the part of one nation for the profit of another; that the sum of the productive powers of man is by these means without any increased labour largely augmented throughout the world; that this increment is due partly to the extinction of ignorance, partly to the suppression of fraud, but mainly to the united efforts of skill and of science in compelling nature to minister to the wants of man; that such skill and science may be of far greater importance than the existence of the raw material in any particular locality.

Effect of Exhibitions.

Knowledge of the progress of other nations is the first step in the ascertainment of the cause. The contrast which the Great Exhibition, 1851, the Exhibition of Paris, 1855, of London, 1862, of Paris, 1867, of Vienna, 1873, as regards tools, machines, and mechanical inventions generally, is said to have been so great that [a superficial observer would be sensible of that which careful and experienced observers have recorded, namely, that in 1851 Great Britain was without a rival, but that at each succeeding exposition there has been a considerable alteration for the worse in the position of Great Britain as compared to that of other countries. The pre-eminence of 1851 was due to its relative advantages and to causes natural and artificial, material, capital, the division of labour, experienced and well-trained artisans. This country has not stood still in the interim, but other countries have advanced with great strides; the differences are diminishing every year; the relative advance must be checked by our more rapid advance. The use of tools and machines whereby one man may do the work of many is the true secret of economic production; this alone presents the means of overcoming the disadvantages resulting from the increased cost of fuel, labour, and materials, the higher rate of wages, and the reduction of the hours of labour. The invention of labour-saving machines, of new tools, and the increased skill of the artisan, afford the only remedy. Many such inventions may be small and apparently unimportant, but their result as a whole may have a considerable effect on the progress of the nation.

The energy of the individual for the amelioration of his condition is inventive industry in its fullest and broadest sense; the progress of physical science and of its practical applications in aid of the constant effort of man to better himself will do much to make a nation prosperous in spite of mismanagement and bad government. Whatever may tend to aid such individual efforts is a public benefit.

Services of the British Commission.

The British Commission furthered the views of the promoters of the Vienna Exhibition as to the Patent Congress, the proceedings of which resulted in resolutions affirming the policy and principle of property in inventions, the expediency of its maintenance, and of the assimilation of the systems of all countries.

The services rendered by the Officers of the British Commission in repressing two serious piracies of the trade mark and trade name of two eminent English firms has been already referred to as a great boon to all manufacturers.

The British Commission, however, rendered another and most important service to English exhibitors and manufacturers, viz., the translation and publication of—the Austrian Tariff of Import Duties, with comparative tables of Austrian, British, and French money weights and measures;—the Anglo-Austrian Treaty of Commerce (16 December 1865); the Austro-Hungarian Laws relating to inventions, industrial designs, patterns, models, and trade marks, and the provisional protection for objects exhibited at the Vienna Universal Exhibition, 1873. (*See* App. W, and X. *post* 561, 565.)

Exhibitions of the Industry of all Nations inaugurated by the Prince Consort in 1851, and consummated by the Vienna Exhibition in 1873, will do much not only in furtherance of the objects already adverted to, but towards the realisation of that unity of all mankind, which, in the words of that illustrious Prince, is not a unity which breaks down the limits and levels the peculiar characteristics of the different nations of the earth, but rather a unity the result and product of those very national varieties and antagonistic qualities.

I have the honour to remain,
Your Royal Highness,
Your most obedient servant,
THOMAS WEBSTER.

The Temple,
March 1874.

APPENDIX.

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APPENDIX A.

Nr. 80.

UNIVERSAL EXHIBITION, 1873, IN VIENNA.

INTERNATIONAL CONGRESS for the Consideration of the Question of PATENT PROTECTION.

PROGRAMME.

To the series of disputed questions within the province of political legislation belongs at this moment the question of patent protection, or rather the question of the protection of the rights of the inventor.

As an object of legislation, its origin extends back to former centuries, as, for instance, in Great Britain the right of the Crown to the concession of patents for invention was firmly retained by the Act of Parliament of 1623; but as a matter of controversy, it is scarcely twenty years old, yet notwithstanding its recent date, it already possesses its peculiar history. The question of patent protection as it now stands, includes no longer simply the inquiry how the right of the inventor is to be protected in the best manner, the most conformable to its design and the least prejudicial to the general welfare; and whether the natural right of the inventor may become regarded in advance as absolutely justified; but the question rather imposes upon those who apply themselves to its consideration, first the duty of refuting the latest doubts and scruples against the practicability and economical utility of such a protection; and then the endeavour to effect a uniform transformation of the existing law of patents which is now as various as it is complicated.

It would scarcely accord with the importance of the pending question of patent protection to disregard the chief arguments of its opponents. There exists to-day an anti-patent movement which since 1860 has extended too far, and the causes of which movement bear, in part at least, too much upon views which are generally acknowledged by the economical progress of our age, to justify at this time as hitherto a partial solution of that problem.

The complete abolition of all patents for inventions, such is the motto of this movement; patent protection, the maintenance and improvement of the existing patent law, if possible in simple form, and by international agreement: such is the watchword of the other.

The present condition of patent legislation in the most enlightened and progressive countries, shows on which side the majority stands; with the exception of Switzerland and with her, Holland, which recently abolished her patent law, the legislation of all the other industrial states to-day recognises the protection of patents as a necessity; and the history of the patent system for the last twenty years is a continuous evidence of the tendencies of the respective governments, not in the direction of a gradual abolition, but in the direction of a thorough reform of patent protection, and especially in removing the disadvantages of a territorial limitation of patents granted for inventions.

All the views however, even those of the partisans of patent protection, unite invariably and unexceptionally in this, that the protection of the rights of inventors needs new forms corresponding to the altered international commercial relations; and that the solution of this question of reform should not be aimed separately as hitherto, by each state of the great international commercial area, but rather, that a complete solution common to all states should be accomplished by international agreement.

This work of reform can the less dispense with such unanimity, as the present territorial limitation of patents for invention, forms one of the chief defects of the existing system, and as matters now stand, the days of patent protection on the continent may be regarded as numbered, should the effort fail to establish an universal rule and introduce it into the law of nations.

We live no longer in the day of industrial action, which is strictly confined and is removed from foreign competition, and where slow communication prevents or delays the utilisation of inventions. We live at a time of liberal customs policy; steam and electricity have newly united once isolated seats of industry in a way undreamt of; and the mutual exchange of goods shows to-day a magnitude which a generation ago one could not have imagined. Under such altered relations the patent granted for an invention in one country becomes in fact a restriction unprofitable and obstructive, if the same invention without limitation or increase in price, becomes in an adjoining country common property. The artisan who in the one country must work with the auxiliary material there patented and therefore dearer in price, will suffer an essential injury as soon as the same material is produced in the other country, not only without restriction, but with a damaging competition. Moreover, a continuance of the hitherto antagonistic views and measures would scarcely conduce to the preservation of general harmony; and if for example patent protection were maintained in one country, so as to attract thereby skilled operatives from another, then the danger of disturbance of the international industrial balance might readily be apprehended. Such and similar inconveniences can only be met by the common action of all civilized states, disposed to the maintenance of patent protection.

The solution of this problem may be alike difficult and tedious, but the impossibility of its solution has, however, not been proved, and it is at all events a problem the importance of which is worthy the effort.

But where for such an attempt could be found an occasion more appropriate and more legitimate, than one where the labouring part of mankind meet from all quarters of the world in peaceful rivalry! where men of science, and of practical ability, scientific artisans and political economists, representatives of the higher industry and the smaller trades, unite to bear testimony of the high degree of culture, to which education, labour and inventive spirit have advanced the human race!

The Vienna Exhibition of 1873, called for the embodiment of universal progress in culture, would seem more peculiarly adapted to pay tribute to the spirit of invention, even from the standpoint of modern legislation, and to form the starting era for a new and universal codification of the rights of inventors. Had there been any doubt of the ~~connexion of this right~~ with the aims and ends of such an Universal Exposition, previous exhibitions would have solved it. The recent patent legislation of England is the immediate result of the London Exhibitions of 1851 and 1862, while the Paris Exhibitions of 1855 and 1867 produced, as is well known, temporary protection laws, which it was thought expedient to imitate, in the preparatory acts for the Vienna Universal Exhibition of 1873 (Law of 13th November 1872).

In pursuance of these views, and following a suggestion of the Government of the United States of America, the General Direction of the Universal Exhibition intends to unite with the Exhibition an International Congress, which shall discuss the question of patent right; should this discussion, as may be foreseen, induce a vote in favour of patent protection, it will then be the task of this Congress, on the basis of the experience of various countries and the materials collected, to proceed to a declaration of fundamental principles for an international reform of patent legislation.

The International Congress for the consideration of the question of patent protection is to take place after the close of the Jury deliberations, on the 4th, 5th, and 6th of August 1873, under the following regulations:—

1. Manufacturers, scientific artisans, political economists, and other experts, are entitled to participation in the Congress, in both its full and sectional deliberations and in its decisions.

2. The applications for participation in the Congress must be made to the respective Exhibition Commissioners, domestic and foreign. Based upon the applications communicated by these Commissions (at the latest by the end of June 1873), to the Chief Manager of the Universal Exhibition, cards entitling the applicants to membership will be transmitted to them.

3. It will rest with the Governments of nations which exhibit, to be represented in this Congress by special delegates.

4. At the seat of the General Direction, a committee of preparation will be appointed, whose duty it shall be to prepare the materials to be laid before the Congress, to elaborate the matters of inquiry, and in general to prepare all the preliminary matters for the opening of the Congress.

5. The chief manager of the Universal Exhibition opens the Congress. After its opening, the Congress elects from its members the President and the Bureau, determines the order of business for the accomplishment of its work, and proceeds then to a general discussion of the question of patent protection.

The decisions of the Congress will be communicated through the several Commissions to the respective Governments.

6. The language of the Congress is German, but the English, French, and Italian are also admitted.

7. All written communications, works, and propositions, relative to the International Congress for the consideration of patent protection, are to be addressed to the chief manager up to the time of the opening of the Congress, but during its sittings to the Bureau of the Congress.

42, Praterstrasse,
March 1873.
Vienna.

The President of the Imperial Commission:
ARCHDUKE RÉGNIER.
The Chief Manager:
BARON DE SCHWARZ-SENBORN.

APPENDIX B.

VIENNA PATENT CONGRESS, 1873.

OFFICERS AND MEMBERS.

HONORARY PRESIDENT:
Baron von Schwarz-Senborn, Vienna.

PRESIDENT:
Dr. C. W. Siemens, F.R.S., &c., &c. London.

VICE-PRESIDENTS:
W. Ritter v. Engerth, Vienna.
Hamilton A. Hill, Boston, U.S. of America.
Eugen Langen, Cologne.
Dr. F. X. Neumann, Vienna.
Dr. Werner Siemens, Berlin.
Thomas Webster, Q.C., F.R.S., London.

GENERAL SECRETARY:
Carl Pieper, C.E., Dresden.

SECRETARIES:
Professor Blake, New Haven, U.S.
Professor Exner, Mariabrunn.
F. Kaupe, C.E., St. Petersburg.
Dr. Carl Ratkowsky, Vienna.
Dr. Franz von Rosas, Vienna.
Dr. Rosenthal, Cologne.

PREPARATORY COMMITTEE:

André, Dr.
Bauer, Dr.
Blake, Prof.
Brachelli.
Engerth, W. Ritter v.
Grothe, Herm., Dr.
Hartig, Dr., Prof.
Haseltine, G., Dr.
Hill, Hamilton A.
Jannasch, Dr.
Jenny, Dr.
Kaupe, F.
Klostermann, Dr.
Langen, Eugen, C.E.
Neuwirth, J.
Pieper, Carl, C.E.
Ratkowsky, Dr.
Reuleaux, G.
Rosas, v. Dr.
Rosenthal, Dr.
Schwartz, Dr.
Siemens, C. W., Dr.
Siemens, Werner, Dr.
Webster, Thomas.
Weinmann, Fr., Dr.

DELEGATES AND REPRESENTATIVES.

Aureliano, P. S.	Rumania.
Baumhauer Dr. E. A. v.	Holland.
Codazza, Giovanni, Commendatore	Italy.
Fraenkel, E.	Sweden.
Klostermann, Prof. Dr.	Prussia.
Metaxa, Themistokles	Greece.
Ott, Adolf	Switzerland.
Porto, Seguro	Brazil.
Thacher, Honble. J. M.	United States of America.
Vischer, R.	Wurtemburg.
Webster, Thomas, Q.C., F.R.S.	Great Britain.

MEMBERS OF CONGRESS PRESENT AT VIENNA.

Ammermüller, Dr., Fabrikant in Stuttgart.
André, Dr. Jur. Synd. aus Osnabrück, in Vertretung des Vereines deutscher Ingenieure.
Arenstein, Dr., Wien.
Avery, John G. Spencer, Massachusetts, U.S.
Aureliano, P. S., Vertreter der rumänischen Regierung.

Baumhauer, Dr. E. A. v., Professor, und Berichterstatter der niederländischen Regierung.
Bigelow, Lambert, Fabrikant zu Worcester, Nordamerika.
Blake, W. P., Mining Engineer, New Haven, U.S.
Blakey, George, London.
Bochkoltz, August, General Inspector der k. k. priv. Staats-Eisenbahn-Gesellschaft in Wien.
Bode, M., Fabrikant in Wien.
Borszéky, Soma, Pest.
Böcke, F., Ingenieur und Director in New York.
Boteler, C. M., Washington, U.S.
Brecht, T., Assist. Examiner, Pat. Office in Washington.
Brewer, Eben., Westfield, New York.

Christy, Stephen, London.
Codazza, Giovanni, Commendatore, Vertreter der italienischen Regierung.
Collyer, Robert, Dr., Vertreter des "Inventors' Institute" in London.

Daimler, G., Director der Gasmotorenfabrik in Deutz bei Cöln.
Diefenbach, k. würtembergischer Regierungsrath, Stuttgart.
Diethelm, Carl, Ingenieur in St. Gallen.
Draxler, Frank, Mobile, Alabama, U.S.

Egan, Alfred, Ober-Ingenieur der Theissbahn in Ofen.
Engerth, W., Ritter v., Hofrath, General Director der Staatsbahn in Wien.

Ewan, M., London.
Exner, W. F., Prof., Dr. in Mariabrunn.

Fairfield, Geo., A., Hartford, U.S.
Fraenkel, E., Staatsbahn-Director, Vertreter der schwedischen Regierung.
Friedmann, Alexander, Ingenieur in Wien.
Frölich, Julius, Ingenieur aus Landsberg a. W.

Görz, Joseph, Ingenieur in Mainz.
Gans, Albert, Wien.
Gilgenheimb, Baron von, Weidenau, Oesterr.-Schlesien.
Gottheil, Edward, Civil-Ingenieur in New-Orleans.
Gottheil, R., Patent Agent in Berlin.
Graves, Gustave, Brüssel.
Groth, L. A., aus Stockholm.
Grothe, H., Dr., Redacteur der deutschen polytechnischen Zeitung in Berlin.
Grüneberg, H., Dr. in Kalk bei Cöln.

Hall, Henry L., aus Chicago.
Hall, Thomas, Northampton, Mass., U.S.
Hammond, Eduard, Berichterstatter, Boston, U.S.
Hartig, Dr., Professor, Mitglied der sächsischen Patent Commission in Dresden.
Haseltine, Geo., LL.D., aus London.
Hatschek, M., Wien.
Hauthoway, C. L., Boston.
Herrmann, Max, Ingenieur, Dresden.
Hill, Hamilton, A., Boston.
Hinze, W., Ober-Ingenieur, Wilhelmshofen.
Hoffmann, Francis, Ingenieur, Plancher-les-Mines, Frankreich.
Hoffmann, F., Baumeister in Berlin.
Hoffmann-Linke, Max, Leipzig.
Hornig, Emil, Dr., Professor in Wien.
Hotchkiss, B. B., aus Paris.
Howe, G. H., Cleveland, Ohio, U.S.
Howie, J. J., aus London.
Höppner, Th., Ingenieur aus Liegnitz.

Jacovenco, Paul, Odessa.
Jannasch, Dr. Ju., Proskau.
Jenny, k. k. Bergrath-Professor in Wien.
Jenoure, A., Civil-Ingenieur, Ivycross, Kew, London.
Joy, A. Ch., Professor der Chemie in New York.

Karmarsch, Dr., Professor, geheimer Regierungsrath in Hannover.
Karop, Eduard, Ingenieur in Wien.
Kaupe, Friedrich, Ingenieur in St. Petersburg.
Kiddo, J. B., United States Army.
Klostermann, Dr., Prof., Oberbergrath in Bonn.
Környei, Eduard, Dr., Advocat in Pest.
Kraft, J., Ingenieur der Wagenfabrik "Rathgeber" in München.
Kraus, Jacob, Pest.
Kreith, Franz v., Dr., Advocat in Wien.

Langen, Eugen, aus Cöln, Vorsitzender des deutschen Ingenieur-Vereines.
Lonszky, Adolph, Pest.

Marchet, Dr. Gustav, Professor an der Forstschule in Mariabrunn.
Mayet, P., aus Berlin.
Mehlis, G., Director der Maschinenfabrik "Cyclop" in Berlin.
Meigs, Joe V., Massachusetts, Nordamerika.
Metaxa, Themistokles, Ritter von, in Vertretung der k. griech. Regierung.
Mintzer, S. J. W., Dr. aus Philadelphia.
Munson, H. T., Examiner, Patent Office in Washington.
Müller, Moritz, Redactions-Mitglied des "Engineering" in London.
Myers, A. G., Ingenieur, Director d. Bur. z. Förderung amer. Industrie, New York.
Nagel, A. L., Ingenieur and Fabrikbesitzer in Hamburg.
Neumann, F. X., Dr., Professor in Wien.
Neumann, A., in Weidenau, Oesterr.-Schlesien.
Neupauer, Joseph, Dr., Hofgerichts-Advocat in Wien.
Neuwirth, J., Schriftsteller in Wien.
Nieberding, Regierungsrath im Reichskanzleramt in Berlin.

Offermann, Carl Ritter v., Fabriksbesitzer in Brünn.
Ohm, C., Vertreter des ungarischen Landes-Industrie-Vereines in Pest.
Oncken, Aug., Dr. in Wien.
Ott, Adolf, Vertreter der schweizerischen Regierung, Bern.

Paget, C. O., Ingenieur in Wien.
Paget, Eduard, Fabrikant in Wien.
Paget, F. A., Ingenieur in London.
Paget, H., Fabrikant in Wien.
Phillips, W. (Thom. Bradford & Comp.), Manchester.
Pieper, Carl, Civil-Ingenieur (internationales Patent-Bureau) in Dresden.
Pisling, Dr., Schriftsteller in Wien.
Pollmann, Ignaz, Hauptmann a. D., Tulln.
Potocky, Graf A. v. Excellenz, Wien.

Raetke, Heinrich, Patentagent in Berlin.
Ratkowsky, M., Dr. Juristenpräfect am k. k. Theresianum in Wien.
Raymond, R. W., Dr. in New York.
Rayner, W. H., Wilson Sewing Machine Co., Ohio, U.S.
Reifer, J. J., Ingenieur in Winterthur.
Reitlinger, Edmund, Dr., k. k. Professor in Wien.
Remington, Samuel, Fabrikbesitzer, Ilion, New York.
Reuleaux, Dr., Professor, geheimer Regierungsrath in Berlin.
Reuleaux, Carl, Ingenieur in Turin.
Ritz, Louis, Cincinnati, Ohio, U.S.
Rollins, J. G., Ingenieur aus London.
Rosas, Franz, Dr., Edler v., k. k. Finanzrath in Wien.
Rosenthal, Dr. in Cöln, in Vertretung des Vereines deutscher Ingenieure.
Rühlmann, Dr., Professor in Hannover.
Ruston, F. S., Fabrikbesitzer, aus Lincoln.

Sachsenberg, G., Fabriksbesitzer in Rosslau an der Elbe.
Schmidt, Eduard, Dr., Civil Ingenieur in Wien.
Schneider, B., Regierungsrath, Dr., Dresden.
Schupp, Wilhelm, Ministerialrath in Carlsruhe.
Schwarz-Senborn, Freiherr v., General-Director der Weltausstellung.
Schwendler, Louis, Superintendent Electrician of Government Telegraphs, Calcutta.

Scott-Moncrieff, W. D., Glasgow.
Siehmon, A., Ingenieur in Pest.
Siemens, Werner, Dr., Fabriksbesitzer in Berlin.
Siemens, C. William, D.C.L., F.R.S., President of the "Institution of Mechanical Engineers," London.
Sommerfeld, Wilh., Redacteur des "Oesterreichischen Oeconomist" in Wien.
Steding, Alexander, Moskau.
Steenberg, A., Redacteur der "Industri-Tidende" und Patent-Agent in Kopenhagen.
Steinbeis, v., Dr., Excell. Präsident der Centralstelle für Gewerbe und Handel in Stuttgart.
Steiner, Julius, Techniker in Chemnitz.
Suess, Friedrich, k. k. Professor in Wien.
Szabel, Albert, Ritter v., in Olmütz.

Traun, Heinrich, Dr., Fabrikant, Delegirter der Gewerbekammer in Hamburg.

Vischer, Regierungsrath in Stuttgart, Vertreter der k. würtembergischen Regierung.

Wagener, G., Dr., Vertreter der Ausstellungs-Commission für Japan.
Wagner, Lad. v., Professor an der k. polytechnischen Schule in Pest.
Walcher-Moltheim, v., k. k. Generalconsul in Paris.
Walkhoff, J. H., Ingenieur und Fabrikant aus Hamburg.
Wanzer, R. N., Fabrikbesitzer, Canada.
Warth, Albin, Fabrikant in Stapleton, U.S.
Webster, Thomas, Q. C., aus London, Berichterstatter der k. engl. Regierung.
Wheeler, C. Gilbert, Ph. Dr., Professor in Chicago, U.S.
Weinmann, Fr. L., Dr. in London, Referent der englischen Ausstellungs-Commission.
Weiss, C., Ingenieur der Locomotivfabrik Krauss & Comp. in München.
Whitney, Baxter, Dr., Massachussetts, U.S.
Wilder, G. S., Chattanooga, Tennessee, U.S.
Winkelmann, E., Wien.
Wirth, Franz, Redacteur des "Arbeitgeber" in Frankfurt a. M.
Woods, Geo. H., Fabrikant, New York, U.S.
Woods, J. O., per Wheeler and Wilson, Wien.
Wolf, R. L., aus Wien.
Wolff, Ober-Maschinenmeister in Oldenburg.

Zimmermann, J. F., Fabrikant in Hanau.

OTHER MEMBERS OF CONGRESS.

Ashton, William, C.E., Manchester.

Backes, Dr., Vorstand des Gewerbevereins, Cöln a. Rh.
Bell, Th., Maschinenfabrikant, Kriens.
Benze, Leopold, Director der Waggonfabrik, Hernals, Wien.
Bergmann, S., Fabrikbesitzer, Hattingen.
Bergner, Theod., Fabrikant, Philadelphia.
Beurle, Chr., Wien.
Blakey, George, London.
De Bruyn-Kops, Frankfurt a. M.
Buser, Tr., Ingenieur, Moskau.

Carow, Julius, Maschinenfabrik, Prag.
Clauss, J. C., Maschinenbauverein, Chemnitz.
Cox, H., per De Bergue & Co., Manchester.

Drake, Edw., J. & F. Howard, Bedford.

Elbers, Eduard, Eisenwerksbesitzer, Hagen.
Eyth, Max, Ingenieur, Leeds.

Findeisen, C. H., Fabrikbesitzer, Chemnitz.
Von Freeden, Director der Seewarte, Hamburg.
Funcke, Wilh., Fabrikbesitzer, Hagen.

Grahl, R., Director der sächs. Gussstahlfabrik, Döhlen.
Von Gruber, Director zu Pecek, Prag.
Gruson, H., Commerzienrath, Eisengiessereibesitzer, Buckau.
Guzzi, Ingenieur, Mailand.

Heine, W., General, Dresden.
Heinrich, F., Mathäusgasse 13, Wien.

Jahnel, Martin, Director der Prager Dampf- and Segelschiff-Gesellschaft.

Kaemp, Ingenieur, Fabrikbesitzer, Hamburg.
Kellner, Director der sächsischen Schiffs- and Maschinenbaut-Anstalt, Dresden.
Klauke, Alex., Ingenieur, Düsseldorf.
Kraft, J., Ingenieur en chef Société Cockerill, Seraing.
Kraut, Dr., Professor, Hannover.

Lange, Carl W., Fabrikbesitzer, Essen.
Langen, O., Fabrikbesitzer, Wien.
Liernur, Ingenieur-Capitain, Frankfurt a. M.
Lincke, Professor a. d. polytechn. Schule, Darmstadt.

Mond, L., Fabrikbesitzer und Chemiker, Farnworth, England.
Müller, Ch. G., Maschinenfabrikant, Hannover.

Nobak, Gustav, Ingenieur und Fabrikbesitzer, Prag.

Platt, Fabrikbesitzer, Oldham.

Rautenbach, C., Civil-Ingenieur, Cöln.
Ravizza, Ingenieur, Patent-Bureau, Mailand.
Reith, E., sächs. Maschinenfabrik, Chemnitz.
Rost, C. E., Maschinenfabrikbesitzer, Dresden.

Schmalz, Aug., Maschinenfabrikant, Offenbach.
Schulze, Jul., Secretär der Handelskammer, Mainz.
Siemens, Friedr., Glasfabrikant, Dresden.
Springmann, Th., Fabrikbesitzer, Hagen.
Storey, John, M. J., mech. eng. Fabrikant, Manchester.

Toepffer, R., Ingenieur, Magdeburg.
Trapper, Director, Wetter a. d. Ruhr.
Turner, Fabrikbesitzer, Hannover.

Valentin, S., (M. Webers), Fabrikbesitzer, Berlin.

Weiss, Dr., Professor am Polytechnicum, Dresden.

Zimmermann, F., Halle a. S.

APPENDIX C.

REPORT of SELECT COMMITTEE OF HOUSE OF COMMONS. Session 1872.

REPORT.—(Session, 1872.)

The SELECT COMMITTEE appointed "to inquire into the Law and Practice and the effect of Grants of Letters Patent for Inventions;"—Have considered the matters to them referred, and have agreed to the following report:—

Your Committee have continued the investigation commenced last session into the law, practice, and effect of Grants of Letters Patent, and after a careful consideration of the evidence on the respective branches of the inquiry given by eminent lawyers, patent agents, inventors, and manufacturers of this and other countries, have arrived at the conclusions contained in the following resolutions:—

1. That the privilege conferred by letters patent promotes the progress of manufactures, by causing many important inventions to be introduced and developed more rapidly than would otherwise be the case.

2. That the same privilege leads to the introduction and publication of numerous improvements, each of a minor character, but the sum of which contributes greatly to the progress of industry.

3. That in the absence of the protection of letters patent, the competition of manufacturers amongst themselves would, doubtless, lead to the introduction of improved processes and machinery, but that it would probably be less rapid than under the stimulus of a patent law.

4. That it does not appear that the granting of pecuniary rewards could be substituted, with advantage to the public interest, for the temporary privilege conferred by letters patent.

5. That the existing patent law of this country and its administration are in many respects defective, and require considerable improvement in the interests of the public, of manufacturers, and of inventors.

6. That protection for a limited period, and dating back to the time at which it is applied for, should only be granted for an invention on its nature, and particular points of novelty, being clearly described in a provisional specification, and upon the report of a competent authority that such invention so far as can be ascertained by such authority, is new, and is a manufacture within the meaning of the law.

7. That letters patent ought not to be granted for any invention so protected until the provisional specification has been open to inspection, nor until a complete specification has been deposited fully describing the means of carrying it into effect, and such complete specification has been found by the same authority to accord in all essential particulars with the description of the invention in the provisional specification.

8. That all letters patent should be subject to the condition that the manufacture shall be carried on within the United Kingdom, so as fully to supply the demand for the same on reasonable terms to the public, and with due regard to existing interests.

9. That letters patent shall not be valid for an invention which has been in use in a foreign country, unless a patent for the same shall

have been granted in such country, and unless such letters patent shall have been granted in this country to the original inventor, his assignee, or authorised agent.

10. That the duties payable on patents should be so adjusted as to encourage inventors to the utmost to make known their inventions, and that their primary application should be to the purposes of a complete and well organised record of industrial progress, and to an improved establishment for the conduct of patent business.

11. That no person concerned in the administration of the patent law should have a pecuniary interest in the number of patents applied for, granted, or refused.

12. That inasmuch as the property created by the patent law and the questions arising under it, are peculiar, the tribunal for deciding contentious matters in reference thereto should, both as to its constitution and procedure, be adapted to those peculiarities.

13. That the present condition of the Patent Commission is open to serious complaints.

14. That the Patent Law Amendment Act of 1852, provided that the Commission should consist of certain *ex officio* Commissioners, viz.: the Lord Chancellor, the Master of the Rolls, and the Law Officers of the Crown for England, Scotland, and Ireland together with other persons to be appointed by the Crown, but no such other persons have ever been appointed.

15. That the Lord Chancellor, the Master of the Rolls, and the two English Law Officers are now the only Commissioners, and by reason of their other engagements it is very difficult to get a meeting of the Commissioners, and practically an officer in the Patent Office does the duty of the Commission.

16. That the law and its administration are defective:

(*a*.) They admit of protection, and, subsequently, of a patent being granted for an invention which is not properly the subject of letters patent, not being a manufacture, or, being a manufacture, is not new; and of patents being granted for the same invention to several contemporaneous applicants.

(*b*.) They offer no guarantee against patents being used solely or chiefly for the purpose of obstruction.

(*c*.) The facilities afforded to an intending patentee for ascertaining whether his invention is new are insufficient.

(*d*.) The time, trouble, and expense involved in proceedings affecting the rights of patentees and of the public are excessive.

17. That the following alterations of the law and of its administration are desirable:—

(*a*.) That protection be not granted to any invention except on the report of a competent person or persons that the conditions of Resolution 6 as to such protection are fulfilled.

(*b*.) That no warrant for sealing letters paten be issued until the conditions of Resolution 7 are fulfilled.

(*c*.) That in the case of several concurrent applications for a patent for the same invention the patent be granted to the first applicant, unless it be shown to the satisfaction of the proper authority that he is not the first inventor.

(*d*.) That all trials of patent causes should be before a judge, with the assistance of skilled advisers (who may be Commissioners of patents), and, as a rule, without a jury; but with power for the court to order a jury for the ascertainment of facts in exceptional cases requiring the same.

(*e*.) That the Commissioners be reinforced by the appointment of competent persons of legal, scientific, and technical experience, whose time is not occupied with other engagements to such an extent as to prevent their giving full attention to such administration.

(*f.*) That the Commissioners should make rules, relegating to some of their body, together with competent assistants, amongst other duties, that of ascertaining as to every invention for which a patent is sought to be obtained, whether it is properly the subject-matter of a patent; whether its nature and the particular points of novelty have been clearly described in a provisional specification, and whether, so far as can be ascertained by them, it is a new invention; and, as to the complete specification, whether it fully describes the means of carrying the invention into effect, and accords in all essential particulars with the description thereof in the provisional specification.

(*g.*) That all letters patent should contain the following conditions not hitherto usually inserted therein, viz.:—That the manufacture be carried into effective operation within a reasonable time, within the United Kingdom, by the patentee or his licensees so as to supply the demand therefor on reasonable terms; and that licences be granted by him to competent persons on fair conditions, such conditions, as well as the fact of competency, to be determined, in the event of disagreement, by the Commissioners, due regard being had in such determination to the exigencies of foreign competition.

(*h.*) That besides the assistance afforded to intending patentees by the examination of their specifications, and by the Reference Library of the Patent Office, more satisfactory indices and abridgments of specifications be provided, and more particularly that the practice of accepting, without control or revision, the abridgments prepared by the patentees themselves be abandoned.

(*i.*) That the court or judges having discretion in patent litigation should avail themselves of the assistance of the Commissioners, for the better definition and limitation of the matters in dispute in respect of particulars of breaches and of objections respectively.

(*j.*) That in all further appointments of officers concerned in the administration of the patent law remuneration by fees should (as it has been in the recent appointment of Her Majesty's Solicitor-General) be discontinued.

18. That suitable provision should be made by Parliament for the remuneration of the Commissioners who do not act ex-officio.

19. The Committee are of opinion that there should be an assimilation in the law and practice in regard to inventions among the various civilised countries of the world, and that Her Majesty's Government be requested to inquire of Foreign and Colonial Governments how far they are ready to concur in international arrangements in relation thereto.

8th May 1872.

APPENDIX D.

PROCEEDINGS ON REPORT OF SELECT COMMITTEE.

LETTER to EARL GRANVILLE.

MY LORD, 13, Victoria Street, S.W., 29 July 1872.

IN conformity with the request which your Lordship was so good as to make, that a written statement of the objects of the deputation (if I may use this term) which your Lordship honoured with an interview on the 23rd instant, upon the introduction of Mr. Johnston, M.P. and myself, I beg leave to submit the following:—

The deputation desire that the Government should take action in reference to the 19th Resolution of the Select Committee of the House of Commons on the law, practice, and effect of Letters Patent for Inventions.

I put into your Lordship's hands a print of the Report of that Committee containing such Resolution, which is—

"That this Committee are of opinion that there should be an assimilation in the law and practice in regard to inventions among the various civilised countries of the world, and that Her Majesty's Government be requested to inquire of Foreign and Colonial Governments how far they are ready to concur in international arrangements in relation thereto."

In the course of the interview three several modes of proceeding were suggested,—

I. An international conference invited by Her Majesty's Government.
II. Ascertainment of the readiness or disposition of foreign governments and colonial authorities to concur in international arrangements by communications addressed to them through British representatives and governors.
III. Intercommunication by correspondence between the administrators of the actual patent system of different countries and colonies for the purpose of ascertaining in what respect their practices could be assimilated and regulations introduced under existing laws.

It was stated specially with reference to the last suggestion, that the principles of the existing Patent Laws of the various civilised nations are substantially the same, and that the desired assimilation is mainly assimilation in matters of practice.

Attention was specially called by one of the deputation, from Syracuse in the State of New York, who is an inventor and patentee, to an organised practice in the United States of America of obtaining the earliest information as to inventions in progress of being patented in that country, and then applying for patents in this country, which, if obtained, would date from the day of application and exclude the real inventor.

(Resolutions 9 and 17 c. of the Select Committee point to the propriety of giving priority to the claims of first inventors.)

I lay the information and opinions contained in the last two paragraphs before your Lordship as individual contributions to the elucidation of the subject.

I have no authority to attach any general or particular meaning to the words of the Resolution which the deputation sought to enforce. But as I was its proposer in the Committee, and as it was adopted *nemine contra dicente* by Members of Parliament known to hold opinions at variance one with another on the subject of Patents, I cannot be charged with misinterpreting it, when I respectfully express my conviction that all and any of the three suggestions which I have been requested to repeat in writing by the deputation are within the scope of the Resolution, the language of it in nowise being expressive of satisfaction with any particular mode of stimulating and rewarding invention nor indicative of a desire that the proposed international arrangements or the inquiries preliminary thereto should be limited to countries and colonies that have patent systems of their own.

Personally I am very hopeful of national advantages from the adoption of the first suggestion, which your Lordship will remember emanated at the interview from Mr. Johnston.

I have no doubt that your Lordship who has so much knowledge of, and taken such interest in, the very important question now under consideration, will duly weigh the representations made by the deputation and now respectfully submitted.

I have the honour to be,
My Lord,
Your Lordship's faithful servant,
R. A. MACFIE.

SIR, Foreign Office, August 12, 1872.

I AM directed by Earl Granville to acknowledge the receipt of your letter of the 29th ultimo, and I am to state to you in reply that before Her Majesty's Government can be in a position to judge of the expediency of taking measures with a view to the general assimilation of the law and practice of different countries with regard to inventions, it is desirable to obtain complete information with respect to existing legislation and practice. His Lordship proposes, therefore, to call for reports on the subject from Her Majesty's representatives in foreign countries, and to present them to Parliament next session.

I am to add that any communication on this question in regard to the Colonies should be addressed to Her Majesty's Secretary of State for that department.

I am, Sir,
Your most obedient humble servant,
G. HAMMOND.

R. A. Macfie, Esq., M.P.,
13, Victoria Street.

⁂ *See Collection of "Reports on Law and Practice of Foreign Countries with regard to Inventions" presented to Parliament,* 1873, *called for in accordance with the above letter.*

APPENDIX E.

MEETING of INVENTORS and others, 21 July 1873. [B. Samuelson, M.P., in the chair.

"Resolved,

"That a deputation wait upon Lord Granville to represent to him that returns having been obtained from our embassies and legations abroad, in reference to the patent laws of other countries, it is expedient that advantage should be taken of the meeting of the Congress on patents at Vienna, in order to further the resolution of the Select Committee of the House of Commons on Patents for the sessions of 1871-2, in favour of an international patent law.

"That Mr. Macfie, M.P., be requested to accompany and introduce the deputation."

LETTER to EARL GRANVILLE, 23 July 1873.

Parliament Chambers,
11, Bridge Street, Westminster,
23 July 1873.

MY LORD,

THE objects of the deputation which your Lordship is asked to receive, and which emanates from a meeting of English, American, and foreign inventors, and their representatives, are in accord with the objects of the deputation of the 23rd day of July 1872, to your Lordship, as subsequently stated in a letter to your Lordship from Mr. Macfie of the 29th of July 1872, and to which your Lordship was pleased to reply on the 12th of August 1872. (*Ante*, p. 412.)

It is conceived that the approaching International Patent Congress at Vienna, to which the Government of the United States has accredited special commissioners (one of whom, the Hon. J. M. Thacher, now in this country on his way to Vienna, will accompany this deputation), affords an opportunity of forwarding the objects of that memorial, and of utilising the reports, respecting the law and practice of foreign countries with regard to inventions asked for by your Lordship, and presented this session to Parliament.

The resolution in consequence of which this interview is sought is as follows:—

"Resolved,

"That a deputation wait upon Lord Granville to represent to him that returns having been obtained from our embassies and legations abroad, in reference to the patent laws of other countries, it is expedient that advantage should be taken by this country of the meeting of the Congress on Patents at Vienna, in order to further the resolution of the Select Committee of the House of Commons on patents of the sessions 1871 and 1872, in favour of an International Patent Law.

"That Messrs. Webster, Newton, Wise, and Haseltine make the necessary arrangements for the deputation to Lord Granville.

"(Signed) B. SAMUELSON.

"21st July 1873."

It is respectfully suggested that certain persons competent to give information to, and take part in, the forthcoming International Patent Congress, should be accredited to Vienna.

We remain, my Lord,
Your obedient servants,
THOMAS WEBSTER.
A. V. NEWTON.
GEO. HASELTINE.
W. LLOYD WISE.

To the Right Hon.
The Earl of Granville,
&c. &c.

MEETING of INVENTORS and others, 23 July 1873.

Resolved,

That a deputation wait on General Schenck to request his assistance towards obtaining the co-operation of the Foreign Office in furtherance of the objects of the International Patent Congress at Vienna, by appointing or recognising persons accredited to take part in that Congress.

REPLY from EARL GRANVILLE to MEMORIAL.

GENTLEMEN, Foreign Office, 28 July 1873.

I AM directed by Earl Granville to acknowledge the receipt of your letter of the 23rd instant, and I am to state to you, in reply, that the subject of patents is not one which comes under the consideration of this Department, and that the Board of Trade must be consulted before his Lordship could take any steps in the matter beyond furnishing a letter of introduction to Her Majesty's embassy at Vienna to any gentlemen who may wish to attend the International Exhibition in an unofficial capacity, with a view to taking part in the conference about to be held in connexion with the exhibition by persons interested in the subject.

I am, gentlemen,
Your most obedient humble servant,
TENTERDEN.

Messrs. Webster, Newton,
Wise, and Haseltine,
11, Bridge Street, Westminster.

APPENDIX F.

See "Proceedings of Congress," p. 6 of Report.

SIR, House of Commons, 25 July 1873.

I HAVE the honour to acknowledge your letter dated 21st inst. and I assure you I esteem highly the compliment of being specially invited to attend the conference on patents for inventions. I regret that I cannot accept this invitation. My engagements here and in Scotland are decisive.

I remember with pleasure conferences somewhat similar, at which I had the honour to be present, at Dresden and Ghent. At the former of these places, a congress of political economists declared itself opposed on principle to the monopoly system of rewarding inventors. At the latter in the congress of the International Association for the Promotion of Social Sciences, a vote was unanimously passed, on the basis of a paper of mine, in favour of an international system of dealing with inventions.

My opinions, if expressed at your conference, would be found in substantial accord with both of these resolutions; for I think it obviously beneficial to any country subjected to patents that other countries which are its competitors in trade and manufactures should be liable to the same burdens and restrictions, otherwise they gain an unfair advantage. Their freedom from restrictions and prohibitions, their exemption from "royalty taxes" or duties to the holders of patent rights, acts in their behalf very much, and, indeed, with aggravation, as a protective differential duty on the productions of the country that is their rival. Such is the character and effect of royalties exacted by patentees. When royalties are not accepted and the legal monopoly enforced the protectionism of the patent system becomes prohibitionism. But I am quite prepared to advocate liberal treatment of inventors. If any inventor proves by his success that his new act is a valuable contribution to society, I would gladly see him honoured and made the recipient of a sum of money.

Let there be an international committee of the several states of the civilised world, constituted to make honorary acknowledgments and confer suitable rewards in all such cases. A comparatively small pecuniary contribution by each state would suffice. Assume it to be what you will, I doubt not it would put more money into the pockets of deserving inventors and adventurous manufacturers than the existing system of granting (too promiscuously and without such discrimination as to make it creditable to be a patentee) what we euphemistically call "exclusive privileges," *i.e.*, a more than royal power to forbid one's fellows for 14 years to make or use processes, or machines, or knowledge which the course of Providence opens to view and brings within reach. As to the people, on whom ultimately the burden of patents falls, they would be immensely advantaged by the exchange of the present mode of "purchasing" new methods and arts for the simple and natural one of direct pecuniary contributions based on accurate estimates of their worth formed on the incontestable proof of value established by experience and actual use. No one country probably would be assessed, in order to provide as its quota 100,000*l.* Will any expert calculate how much, in royalties, in enhanced prices, in retardation of improvements, and in various directions which I need not follow out, the present system costs? Whoever does so may expect to find the result, reducing it to money, will reach several millions. The British Government a few years ago appointed a commission, presided over by the present Earl of Derby, to inquire regarding patents. This commission indicated in its report that the question of the policy of granting patents deserves to be considered. Since then the Commons House of Parliament appointed a committee on the subject of patents, one of whose recommendations was that there should be introduced into the patent system the principle of internationalism as well as compulsory licenses, *i.e.*, abolition of the monopoly element in grants of patents. I call your special attention to the evidence given to that committee by M. Schneider. This eminent "tradesman," and statesman sanctions by his weighty opinion the idea that the obnoxious system might be continued if much more of formality and rarity conditioned its future. He would make patents quite exceptional favours, to be granted only in cases of special promise, specially examined and adjudicated on. To this compromise few would loudly object. I hope the deliberations about to take place at Vienna will have mainly in view the welfare of society, allowing the interests of producers and consumers to predominate over the pretensions of ingenious contrivers, who have hitherto, little to the advantage of many among themselves, been stimulated into unhealthy and destructive activity.

My friend Mr. Webster, Q.C., has kindly agreed to carry for you 20 copies of a compilation I made three years ago of arguments *pro* but chiefly *contra* patents as hitherto administered. Will you do me the honour to accept and circulate these.

I am confident that your conference will mark and institute an epoch if it eventuate in arrangements such as will be found imperfectly sketched in that volume.

Again expressing the disappointment I feel at not being a sharer in your consultations, but anticipating therefrom such propositions as the British Government (in which a judgment adverse to patents begins to prevail, on the woolsack, in the War Office, at the Treasury, and elsewhere) may hail as a practical step towards solution of a great question hitherto not grappled with, and indeed barely considered as to its principle, in most states of the civilised world.

I have the honour to be, Sir,
Your faithful humble servant,
R. A. Macfie.

To the
Baron Von Schwarz-Senborn,
&c. &c.

APPENDIX G.

LETTER of MR. BENNET WOODCROFT, F.R.S., to LORD CHANCELLOR CRANWORTH.

Communicated to the Vienna Patent Congress by Dr. Haseltine, 6 Aug. 1873.

Great Seal Patent Office,
November 1856.

MY LORD,

AVAILING myself of the vacation which has just terminated, I visited some of the patent offices on the continent, to make myself acquainted with the gentlemen who presided over them, and learn their mode of conducting patent business. My object was also to endeavour to bring about a weekly communication between their several departments and this office, in which I was successful in all cases, and to ascertain what views were entertained generally as to the desirableness of an international patent law.

It is proposed to introduce measures for the amendment of the patent laws of France and America in the course of the ensuing year, and an early change is contemplated in the patent laws of Belgium, Holland, and Austria.

I found in all the countries which I visited that the principal officers connected with the grant of patents were in favour of a law embracing some clauses in common, and desirous that a conference of persons duly accredited should meet next spring to draw up proposals to be submitted to their respective governments with the view of establishing the patent laws of the various countries on a uniform basis.

If such a meeting were held, and but one common clause resulted from its deliberations, such as limiting patent grants to the true and first inventor and his legal representatives in his or their names only, I am satisfied that great general good would result.

In America I believe it is the practice not to grant a patent to any persons native or alien or their legal representatives unless they are the true and first inventors, and then not to an alien except he makes his application before six months have expired from the date of the patent obtained in his own country.

In this respect the American law is superior to any other with which I am acquainted.

In England patents are granted to aliens either in their own name or as *communications*, and the result is that in a large number of instances the self-same invention is patented first as a *communication* from some person whose name is unknown, and afterwards to the original inventor.

Many such duplicate grants are annually made in this country to the injury of the real inventor, and causing unnecessary trouble and expense in this office. As an example I may mention patent No. 630, which was granted March 20th, 1855, to an Englishman as a *communication* from a foreigner residing abroad.

Three days afterwards another English patent, No. 644, was granted to a foreigner for the same invention.

In the Vienna Patent Office I was told the same evil existed from the facility afforded to pirates of procuring the English printed specifications, and being more active than the true inventors in applying for patents.

This subject being one of such great national importance, I trust the Commissioners will excuse me for bringing it before them.

I have the honour to be, my Lord,
Your Lordship's obedient humble servant,
(Signed) B. WOODCROFT.

The Right Hon.
The Lord Chancellor,
&c. &c.

APPENDIX H.

ADDRESS OF HON. J. M. THACHER TO THE INTERNATIONAL PATENT CONGRESS AT VIENNA, 7 AUG. 1873.

MR. PRESIDENT AND GENTLEMEN,

I WISH to return my hearty thanks to you for the invitation so courteously extended to me to address you here, and to assure you that my interest in the debates of this Congress is not in the least affected by the fact that owing to unfortunate circumstances I have not participated actively therein. I regret exceedingly that I find myself placed in such a position that I have felt it would be improper for me to take my seat as an active member of the Congress; but my sympathies—my whole heart—has been with you, and I hope that the final conclusions and resolutions of this Congress will be fraught with great and important interests to the entire civilized world.

Permit me, gentlemen, briefly to explain what I understand to be the foundation of patent protection for inventions. And first, I believe that patent protection is founded in justice to the individual. One of England's greatest jurists has said, in substance, that it is universally conceded that man has the right of property in whatever he bestows labour upon. This was spoken with reference to manual labour, but when this principle is applied to inventions, by so much as the mental faculties are higher than the physical, by so much does the individual seem to me to have a stronger and more righteous claim to property in the product of these mental faculties than in the product of the physical powers. So then I am prepared to make this my first proposition, and I think it may be sustained before the whole world, that the protection of inventions by some good patent system is founded in justice to man himself, granting to him the right of property in the product of the highest faculties which God Almighty has given to him. I should be glad to elaborate this point. It is one full of interest to us, full of interest to the great mass of inventors throughout the world, but there is so much pressing upon me in the short time which I can consent to detain you from your legitimate discussions that I can only briefly notice this point with others. I wish to say simply this, that comparing the completeness of possession which the inventor has of his inventions with that which he has in the product of his physical powers, there can be found no higher right to the complete control of anything coming into the possession of man than that which he has to the product of his intellectual powers. He has made it himself. If he keeps it to himself it is entirely and solely in his possession. No man can take it away; no process of law can extort it from him. He has a stronger and more valid right to it, based on possession, than even to his landed estates. Now, gentlemen, if this be the case, if man has such complete control over his invention, I can see no obligation on his part to impart it to others, unless it be for his own interest. I can see no obligation on his part to disclose it to others, unless he is permitted to control and use it as he would other property.

But I believe that patent protection is not founded alone upon individual right of property, but that it is based, secondly, on expediency, on the ground of public policy; in other words, that it is not only the right of the individual inventor to receive some protection, some legal recognition of his right to property in his invention, but also that the public welfare is advanced, and demands that he should thus be recognised. It is unnecessary before this assembly of intelligent men, who have thought upon and discussed these subjects, to say one word in support of this proposition. That inventions are beneficial to the world is conceded by all, both those who sustain the policy of patent protection, and those who oppose it. The progress of the industrial arts is desired by every people. Now then, if progress in the industrial arts is desirable, and if inventions are conducive to that end, any system by which inventions shall be stimulated, and thereby greater and more substantial progress shall be attained, is a great and lasting public benefit. But patent protection is desirable on grounds of public policy, not only on account of the general benefits that arise from inventions, but because in this way only can inventors be induced to fully disclose to the public the products of their inventive genius. Give a man no protection, give him no inducement to disclose his invention, and how does he seek to secure some remuneration for the important discovery he has made? The only way open to him is to maintain it a secret. So long as he can keep it concealed from all the world and works it in secret he has some hope of securing benefit therefrom, but the moment he discloses it he loses dominion over it, and it becomes the property of mankind. So that if the inventor has no protection whatever, his only hope of securing some reward for a valuable discovery is to keep it concealed and work it in secret. I need not stop to prove the undesirability of such a practice; it is almost universally conceded. First and greatest of all objections to such a course is the fact, that the manufacture becomes in this way one of the most odious monopolies that can be established, for just so long as the invention can be kept secret and can be practised in secret, and is a desirable product, just so long can the inventor and manufacturer demand from the public whatever price he thinks fit. An article may be held up in price, the public may be compelled to pay any demand, and the possession of the secret handed down from generation to generation, one of the most odious monopolies that can be suggested; or what would be equally disastrous, lost to the world entirely by the death of the inventor. It is necessary then to the progress of the arts, to the substantial welfare of the public, that measures should be adopted which shall induce the inventor to make the fullest disclosure possible of the invention he has made. But we have not reached those millennial days when men shall be influenced by motives of philanthropy alone. Unfortunately it is the pocket that controls men more or less in every station and in every country, and it is only from hope of reward, only from hope of substantial reward, that inventors, as business men, can be induced to disclose their discoveries, and thereby give them to the world as a public benefit. I say then, for the purpose of making the invention a public benefaction by securing its disclosure fully and completely to the world, open to all those who may wish to manufacture under suitable laws, some protection must be afforded, either by patent laws or by some other means.

Passing from this second fundamental principle, which I cannot stop to elaborate, the next inquiry is, if protection is just, and is desirable on the ground of public policy, what is the best system for securing the rights of the inventor and promoting the public welfare? Well, the only means, except by patents, that has been suggested with any show of reason, or really with any support, is that of giving the inventor a certain gross sum as a reward for the disclosure of his invention. It seems to me that the moment this plan is presented to practical minds its defects must be apparent. In the first instance it is impossible to determine the value of an invention when it is first made. Why the history of inventions in our country, and in all others, so far as I know, is to this effect—that some of the most important have been least valued when first disclosed. The facts are familiar to you, and I need not refer to instances. All through the history of inventions in the world we find instances of inventors struggling from year to year to introduce their inventions. Some of them have gone down to the grave impoverished by their exertions, by the expense of time and money which they incurred in their attempts to convince the public that they had produced something valuable, and it has been left for future generations to take up their inventions, introduce them, prove their great utility to the world at large, and receive the reward. I think then it is utterly impracticable to determine the value of an invention when it is first disclosed. Suppose it might be approximately determined the inventor on the one hand might at times receive too large a reward, for not only does history show that inventions have been under-estimated at first, but what has appeared to be valuable and promised to be of great utility and benefit to the world has sometimes proved to be utterly useless. And, on the other hand, if the invention be under-estimated, and the inventor sees his invention coming into general use without adequate reward to himself, the injustice done him is great, and the stimulus to further effort is taken away. The impracticability of this means of rewarding the inventor for his time and expense, it seems to me, must be so patent to every practical mind that it needs no further comment, and I dismiss it with the remark that, so far as our country is concerned, I believe it would be utterly impracticable and impossible to establish such a system there. The grant of letters patent for a limited term is the only other mode which has been adopted as the means of rewarding the inventor and benefitting the public. It appears to me to be the only just and practicable manner of securing these ends. The inventor being secured in the exclusive right to his invention has a fair opportunity to place it in the market the same as any other property, with the hope that the demand will be such as to afford remuneration for his time and expense, while to the public is secured the full disclosure of the invention and its introduction into use. It may seem to follow from what has already been said that the inventor's right must be indefeasible, but just here the public good comes forward and demands that a perpetual monopoly shall not be created, and therefore that the exclusive privilege shall exist only for a reasonable term of years. But there are important considerations to be taken into account in establishing a system of protection by patents. What are some of the elements of a good patent system? I say, first, that patents should be granted only for new and useful inventions; for new inventions only, because no man has the right to enter the public domain and obtain an exclusive privilege for what is already public property; and for useful inventions only, because no man has the right to obtain an exclusive privilege for that which will not work a substantial benefit to the public at large. Now it seems to me that these propositions are so self-evident that they hardly need elaboration. They must commend themselves to the common sense of mankind to such an extent that they hardly need argument in their support. Grant that the inventor has the right of property in his invention, and that right exclusive, and it necessarily follows as a corollary to this proposition, that he cannot have an exclusive right to whatever already belongs to another or to the public. Grant, too, that he should have an exclusive right to his invention, but that he should have that exclusive right only because public policy demands that he should have protection for his property, and it necessarily follows as a corollary of that proposition, that he should not have an exclusive protection for that which is injurious to the public. I think, gentlemen, I may pass from this point with the assurance that it is generally accepted by you, for I am happy to know that in the resolutions you have already adopted it is distinctly recognised and asserted.

I next say that patent protection should be granted only to the original and first inventor. This may seem to be included in, and to follow necessarily from the first proposition, and yet a moment's reflection will show that it is not so included, for if the law of any country should permit the introducer of the invention of another to secure an exclusive right thereto, the first requirements, to wit, that patent protection should be granted for new and useful inventions only, would not be violated. I therefore maintain, as a second requirement, that patent protection should be given to the original inventor only. This appears to follow logically and conclusively from the first proposition suggested, to wit, that patent protection is founded in justice to the inventor, in his natural right as an individual to the product of his mental faculties. If that is so he alone has that right, and he alone, or his legal representatives, can have the right to exclusive patent protection. Therefore if he disclaims that protection, if he says I do not wish to obtain any exclusive privilege for this invention, but prefer to give it to the world, it belongs not to some introducer who takes it from one country and carries it to another, but to the *public*.

I know of no legal right, of no legal principle, by which the mere introducer of an invention from one country to another is justly entitled to an exclusive right. The natural right belongs to the inventor only, and if he neglects to secure it for any reason whatever, it reverts to the public, and should become a part of the public domain. In former times there may have been reason for encouraging the bringing of inventions from one country to another by favouring mere introducers. In the then imperfect means of communications, commercial transactions were attended sometimes with great difficulties and even great danger, and it can readily be seen that it would be just and politic for a government, in order to secure the advantages resulting from the transfer or communication of a foreign invention to its own inhabitants to grant some exclusive privilege to the introducer thereof. But in these days, when means of communication have been so largely and so wonderfully improved, so that two continents can exchange ideas in the twinkling of an eye, and citizens are continually passing from one country to another and mingling freely with each other, the reason for the extension of such privilege no longer exists, and I believe that no country has a just right longer to hold out any encouragement to the introducer of a foreign invention by granting to him any exclusive right therein. The moral effect of such a provision of law should not be forgotten. Perhaps we have seen more of it in America than you have here upon the Continent, owing to the greater number of our inventions, and the greater number of patents which we grant. While we give no exclusive privilege whatever to the introducer of a foreign invention, there are some countries which do extend this privilege, and there are men who make it a business to carry inventions from one country to another. Now, I know of nothing in connexion with patents that has so decidedly an immoral influence upon general business habits as this practice. These persons, some of them our own citizens and some of them citizens of other countries resident with us, watch the issue of patents from our office, and immediately upon such issue *steal* the valuable inventions—I cannot apply a milder term—and carry them to other countries as mere introducers, to the great injury of the rightful owners. One of our leading attorneys, a few days before I left Washington for this country, told me that but a week before a gentleman came into his office and suggested that as he had a large practice before the patent office, and was taking out patents for inventors every week, he would like to arrange with him so that if anything came which was valuable it would be communicated so soon as patented, to be taken to those countries granting privilege to the introducer, and the profits divided. Can one conceive a more immoral practice? I appeal to you, gentlemen, as business men, can you imagine a more vicious and demoralizing practice than this? I am happy to say that the attorney told me he instantly rose, opened the door, and suggested to that gentleman that he should find his way out of the office as soon as possible.

But I proceed to say, thirdly, that I believe the two requirements suggested can be complied with only by establishing a preliminary examination. I do not know but that here this will meet some objection. It seems to be a point upon which some of my friends disagree. But it appears to me so logically necessary that I can hardly conceive that a man granting the two propositions that a patent should be granted only for a new and useful invention, and only to the original inventor can fail to arrive at the conclusion, that there must be a preliminary examination, otherwise how do you know that you are not infringing upon the public domain by granting the patent; how do you know whether you are granting it to the inventor or the introducer? You may establish a form of oath for the applicant, but we know that false oaths are sometimes readily taken, and a man who is willing to steal the invention of another will not hesitate long to swear that it is his own. It seems to me absolutely necessary that the granting of patents should be attended by a prior thorough, searching investigation to determine whether the invention is new and useful, and whether the privilege is sought by the true and original inventor. If an examination is necessary, by whom shall it be made? It can be made by the inventor, by his attorney, or by a corps of official experts, appointed by the government for that purpose. Let us consider for a moment by which of the three ways it is probable the greatest measure of justice may be secured. I think it will be granted by every gentleman that the more disinterested the tribunal, the more impartial will be its decision. If this be so, the inventor is not the man to make a preliminary examination and determine whether his invention is new and useful, for if any of you gentlemen have had experience in patent offices, either in obtaining patents or in granting them, you will probably agree with me that inventors, as a class, very generally fail to see the difference between their own inventions and those of others. It is natural that it should be so—the father is always proud of his child. I think then you will concede that the inventor is not that disinterested party who should determine whether he has the right to a patent. Although his attorney is somewhat further removed from an interest in the invention, still as a matter of business he must be more or less influenced by the wishes of his client; and in his discussions with that client over the result of his examination he must necessarily yield to some extent to the opinions of the latter. He is working for a fee, and that fee frequently depends very much upon the opinion that he gives. We all know how this comes about; it results from an unfortunate weakness of human nature, and although we might wish it were different, we are impelled to take circumstances as they are. It seems to me, therefore, that this work should be done by some person more completely disinterested than either the inventor or his attorney. It follows, then, that there must be some body of experts, call them examiners, or what you will, some official body of experts to take this question into consideration, and determine between the public on the one hand and the inventor on the other. For we must remember that a patent is somewhat in the nature of a contract, by which in exchange for the full disclosure of the invention on the one hand, the public on the other agree that the inventor shall have for a certain number of years a monopoly or exclusive right to its manufacture and use. To determine what is just and equitable between the inventor and the public, what better tribunal can there be than a corps of examiners appointed by the government, and entirely disinterested in the question at issue? Given such a corps of experts, with scientific attainments sufficient to enable them to determine intelligently, questions relating to the working of a mechanical or chemical invention, and also such legal knowledge as shall enable them to properly construe description and claims, entirely disinterested in the result, and it does seem to me that we should have reason to expect them to hold the scales of justice evenly between public right on the one hand and individual right on the other, and that their decisions would in general be more satisfactory to all parties interested than those of any other body of men. I believe then, not only that the grant of a patent should be preceded by a prior careful examination, but also that it should be made by disinterested persons appointed for that purpose by the government of the country in which the patent is issued. This method will also be much cheaper for the patentee than when he seeks the services of a professional expert outside of officials. The cost of patents in the United States, as compared with that in England, bears me out in this assertion. The cost of making an examination in our country is a mere trifle of 15 dollars (3*l.*), while in England, I suppose, it is from 10*l.* to 50*l.*, or even 100*l.*, according to the reputation of the expert employed. Some members of this Congress have had experience in different countries, and can state more accurately the relative cost in each. While the expense of an examination in America is less than in any other country, I believe I am safe in saying the work is performed equally as well, and with as reliable results.

With the provision for official preliminary examination there should be coupled a liberal system of appeals. An examiner may sometimes err in judgment, and the grant of a patent should never rest upon the decision of one man. Let there be provision for appeal, so that the decision of the first tribunal, if adverse, may be reviewed once or more, and the rights of all will be amply protected by a patent system as nearly perfect in my opinion as can be devised.

But I wish to say in general terms, that whatever system may be adopted in any country to be really beneficial, it must be liberally administered. A system of preliminary examinations, although judiciously organised, may be so conducted as to become one of the greatest hardships to which an inventor can be subjected. Prussia affords an illustration in point. Prussia has an examining system which might answer every purpose, but is so administered that it is a common saying among inventors in America, that the examination in Prussia is for the purpose of refusing patents for all inventions. And in that country where it seems to me inventions should be fostered and cherished, and where we might expect the most remarkable results from the scientific and technical knowledge of her people, we find, in fact, the fewest inventions made and patented, perhaps I ought not to say *made*, but certainly the fewest inventions patented. Her inventors seek other countries, where their rights are more generously accorded and their hope of reward has better foundation, while foreign patentees have been taught by the experience of others to shun her Patent Office as a delusion and snare.

The full benefit of a patent system can be obtained only when liberally administered, and by this I mean to include not only liberality in the granting of patents, but also a liberal policy towards the inventor subsequent to such grant. Give the inventor all to which he is entitled, even though the invention should seem small, and then let the judiciary so construe the patent as to fully protect his rights and encourage his efforts. Such a course will be found in the end to be the best, not only for the patentee, but also for the public. The matter of judicial action in relation to patents may be outside the province of this Congress, but I cannot forbear an allusion to it in passing, for it must necessarily have an important influence upon the success of a patent system in any country.

Permit me now to refer briefly to our patent system in America, for I suppose it will be interesting to you to know something of its workings, although I find less necessity for explanation on my part than I expected. Many of our German friends in this Congress appear to have a full understanding of our system, a just appreciation of its beneficial influence, and I cannot commend it more strongly than they have already done. The history of patent protection in America is almost coincident with our existence as an independent nation. The first American Congress in 1790 enacted a law for the protection of inventions based upon the principles which I have already suggested. This law was amended from time to time as public interests seem to demand. It was not until 1836, however, that our system as it now exists may be said to have been established. In December of that year the Patent Office with all its records was destroyed by fire. During the session of Congress that year the Patent Law was carefully revised, and a new law enacted, which has not been materially modified by subsequent legislation. By the law of 1836 the Patent Office was completely organised, a corps of examiners established, and all the machinery of our system, as it now exists, put into operation. We may therefore be said to have taken a new departure in 1836, for up to that time the working of the office had been somewhat irregular, the preliminary examinations desultory in character, and the number of patents granted small in comparison with subsequent results. Since 1836 the development of inventive talent and the advancement of the industrial arts among us has been marvellous even to ourselves. The number of patents granted since 1836 is about 140,000. I happen to have in my hand a copy of our official gazette for 1st July 1873, and I find the number of the last patent of that date to be 140,567. The number of applications for patents has steadily increased from year to year until it now averages from 20–21,000 per annum, and the number of patents granted annually is from 13–15,000. To perform the work of examining this large number of applications, the corps of expert examiners has been increased from time to time until it now numbers about 100, to wit, 24 principal examiners, and the same number of first, second, and third assistant examiners, together with a special examiner of trade-marks and also of interferences. The clerical force has been correspondingly increased, so that the officials of all grades now employed in the office may be stated in round numbers as about 500.

The bare statement of the number of patents granted since 1836 is sufficient to bear me out in the statement that our system has proved to be a most remarkable stimulent to inventive genius, not only in our own country, but throughout the world. But you will very naturally inquire, how many of these patents are valuable? Of course it is impossible to obtain statistical information that shall be entirely reliable on this point, but my official experience has given me such data that I am enabled to form an opinion approximately correct. I have discussed the matter with others, and have sought information from manufacturers, patentees, and legal gentlemen, who have made a specialty of the practice of patent law, and I think I do not exaggerate at all when I say that one half of the patents granted in our country may be considered remunerative. Now I do not wish it to be understood by this that one half of these 140,000 patents have brought fortunes to the pockets of the patentees. They have become remunerative to a certain extent; that is, they have paid expenses and something more. A small proportion of them have become largely remunerative, and the patentees, or their representatives, have obtained large fortunes from them. I think, therefore, it may be said that the influence of our system upon inventions and inventors themselves, has been beneficial beyond all expectation. But you will also ask, what has been the influence of our patent system upon the manufacturing interests of our country? I have taken occasion to make some inquiries upon this point also. A short time before I left Washington the Secretary of State sent out to inventors, manufacturers, and others interested in patents, a series of inquiries, among which were some as to the influence of our patent system upon manufacturing interests of the country. With scarcely an exception, so many of our manufacturers as responded, answered that the patent system was beneficial, beyond all manner of doubt, to the manufacturing interests of the country. It is estimated both by myself and others who are qualified to judge of this matter, that at the present time, from six to seven eighths of our enormous manufacturing capital is based upon patents, either directly or indirectly. In fact, it is almost impossible to organise a company for manufacturing purposes in America, without first securing the control of patents for some valuable invention.

I think then that we may be said to have reached this conclusion, that our inventors, patentees, and manufacturers have all been benefited greatly by our patent system. At the same time the public welfare has been greatly promoted by the general introduction of many valuable inventions, which otherwise would have remained undeveloped, and by the cheapening of many articles by the invention of new and improved modes of manufacture. At the same time we believe the whole world has been benefited by the liberality of our law. We make no distinction between foreign and native applicants, but invite inventors from the whole world to give us the benefit of their inventive genius upon the same liberal terms that we grant to our own citizens, putting upon them no restriction as to time or place of manufacture, or introduction of the invention into public use.

But, gentlemen, while saying this, I do not wish to commend our system above others in all its details. We do not seek to engraft it upon that of other countries; indeed, it seems to me that it would be unadvisable for this Congress to suggest for general adoption the patent law of any one country. But we should be glad if the deliberations of this Congress should result in the acceptance of a few principles like our own, and the recommendation of those principles as the proper basis for patent legislation in the different countries here represented.

These principles I have already suggested. Should they be adopted and sent forth to the world with the endorsement of this Congress, I believe important reforms may in time result therefrom. But the details of a patent system should be left to the different countries to work out for themselves.

Gentlemen, I congratulate you upon the assemblage of this Congress, and trust that your deliberations may result in substantial benefit to the world. It may be some time before the reforms you seek are secured, but the agitation of these questions has here been inaugurated in such a manner, that if continued hereafter, success must eventually crown these efforts. To this end let me express the hope that you will not adjourn without establishing a permanent committee as the representative of this Congress, so that an organisation may be created by means of which the discussion of this subject may be continued from time to time until finally, civilised governments shall become convinced of the righteousness and expediency of the principles here advanced, and there shall be universal recognition of the rights belonging to, and the public benefits conferred by, the inventors of the world.

APPENDIX I.

TABLES showing the NUMBER of PATENTS granted at HOME and ABROAD during the last THIRTY-ONE YEARS.*

TABLE I.—GREAT BRITAIN, BRITISH INDIA, and BRITISH COLONIES and DEPENDENCIES.

YEAR.	GREAT BRITAIN.				BRITISH INDIA.	CEYLON.	MAURITIUS.	NEW SOUTH WALES.	VICTORIA.	NEW ZEALAND	TASMANIA.	CAPE OF GOOD HOPE.	BRITISH GUIANA.	JAMAICA.	TRINIDAD.*	CANADA.	NEWFOUND-LAND.	YEAR.
	Applications for Patents.	Patents Sealed.	Paid Stamp Duty of 50*l*.	Paid Stamp Duty of 100*l*.														
1842	—	371	—	—	—	—	From 1838 to 1852 inclusive, 17	—	—	—	—	—	to June 1869, 28	From earliest period to 1853, 30	—	From 1824 to 1842. 102	—	1842
1843	—	420	—	—	—	—		—	—	—	—	—			—	14	—	1843
1844	—	450	—	—	—	—		—	—	—	—	—			—	11	—	1844
1845	—	572	—	—	—	—		—	—	—	—	—			—	22	—	1845
1846	—	498	—	—	—	—		—	—	—	—	—			—	88	—	1846
1847	—	493	—	—	—	—		—	—	—	—	—			—	32	—	1847
1848	—	388	—	—	—	—		—	—	—	—	—			—	30	—	1848
1849	—	514	—	—	—	—		—	—	—	—	—			—	20	—	1849
1850	—	518	—	—	—	—		—	—	—	—	—			—	35	—	1850
1851	—	455	—	—	—	—		—	—	—	—	—			—	38	2	1851
1852 Jan. to Oct.	—	470	—	—	—	—		—	—	—	—	—			1	41	1	1852
1852 1 Oct. to 31 Dec.	1211	914	310	102														
1853	3045	2187	621	205	—	—	2	—	—	—	—	—			2	52	4	1853

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* In a few cases the Returns embrace a longer period.

TABLE I.—Great Britain, British India, and British Colonies and Dependencies—*cont.*

YEAR.	GREAT BRITAIN.				BRITISH INDIA.	CEYLON.	MAURITIUS.	NEW SOUTH WALES.	VICTORIA.	NEW ZEALAND.	TASMANIA.	CAPE OF GOOD HOPE.	BRITISH GUIANA.	JAMAICA.	TRINIDAD.	CANADA.	NEWFOUNDLAND.	YEAR.
	Applications for Patents.	Patents Sealed.	Paid Stamp Duty of 50*l.*	Paid Stamp Duty of 100*l.*														
1854	2764	1878	513	140	—	—	1	—	8	—	—	—	From earliest period	—	1	54	3	1854
1855	2958	2046	551	195	—	—	2	3	9	—	—	—		—	2	93	5	1855
1856	3106	2094	573	214	11	—	3	1	3	—	—	—		—	1	108	3	1856
1857	3200	2028	584	221	13	—	5	1	65	—	—	—		—	5	116	3	1857
1858	3007	1954	540	197	—	—	3	10	40	—	—	—		—	—	100	1	1858
1859	3000	1977	542	217	14	—	3	11	135	—	5	—		—	4	112	2	1859
1860	3196	2068	579	194	33	6	4	10	76	2	4	From 1860 to May 1869, 18		3	4	153	5	1860
1861	3276	2047	575	179	25	6	12	13	68	1	2			1	6	140	—	1861
1862	3490	2191	646	214	36	2	8	14	53	3	2			1	2	160	—	1862
1863	3309	2094	632	215	33	2	6	18	43	7	4			1	3	159	3	1863
1864	3260	2024	550	178	24	11	6	14	60	8	4			3	1	145	1	1864
1865	3386	2186	582	193	36	5	2	15	58	6	6			1	—	157	—	1865
1866	3453	2124	574	—	44	—	6	22	104	9	4			1	3	265	3	1866
1867	3723	2284	619	—	21	2	6	20	41	7	5			6	15	199	—	1867
1868	3991	2490	729	—	40	11	8	21	68	11	3			1	—	546	—	1868
1869	3786	2407	793	—	48	7	6	27	71	18	5			2	—	581	—	1869
1870	3405	2180	—	—	48	8	13	34	71	To 14 June 13	3	—	—	2	—	556	—	1870
1871	3529	2376	—	—	55	7	15	27	82	—	6	—	—	4	—	509	—	1871
1872	3970	2771	—	—	71	5	11	42	60	—	5	—	—	4	—	671	—	1872

TABLE II.—FOREIGN STATES.

YEAR	UNITED STATES.		FRANCE.	BELGIUM.	AUSTRIA.	ITALY.	† SAXONY.	SWEDEN and NORWAY.	BAVARIA.	WURTEMBERG.	BADEN.	PRUSSIA.	RUSSIA.	SARDINIA.	PORTUGAL.	YEAR.
	Applications for Patents.	Patents Granted.	Patents and Certificates of Addition.													
													From 1814 to 1841, 230			
1842	761	517	—	From 1830 to 1854 7497	—	—	—	36	—	—	—	—	23	—	—	1842
1843	819	531	—		—	—	12	41	77	25	5	55	23	—	—	1843
1844	1045	502	722		—	—	10	50	125			76	24	—	—	1844
1845	1246	502	2666		—	—	16	50	124	22	4	72	18	—	—	1845
1846	1272	619	2750		—	—	31	58	112	18	9	55	20	—	—	1846
1847	1531	572	2937		—	—	30	69	155	12	5	78	22	—	—	1847
1848	1628	660	1191		—	—	29	50	97	8	6	72	21	1	—	1848
1849	1955	1076	1953		—	—	34	70	97	6	8	80	24	2	—	1849
1850	2193	995	2272		—	—	39	67	115	16	2	87	8	9	—	1850
1851	2258	869	2462		—	—	49	61	97	26	8	57	36	11	—	1851
1852	2639	1020	3279		—	—	73	79	77	16	9	82	23	15	—	1852
1853	2673	958	4065		406	—	—	81	36	17	10	84	34	22	11	1853
1854	3324	1902	4563		491	—	76	86	36	29	12	62	43	45	13	1854
1855	4435	2024	5398	From 1854 to 1861 11,941	534	224	78	67	25	27	8	63	23	116	4	1855
1856	4960	2502	5761		645	199	120	73	52	38	22	67	25	187	10	1856
1857	4771	2910	6110		715	221	120	64	41	54	35	53	36	204	7	1857
1858	5364	3710	5828		719	170	106	41	36	42	27	56	71	151	6	1858
1859	6225	4538	5439		654	139	112	87	43	46	30	44	64	127	15	1859
1860	7653	4819	6122		468	183	131	70	61	65	38	84	73	To end of Sept. 128	22	1860
1861	4643	3340	5941		569	224	134	99	51	68	23	102	46	--	7	1861

TABLE II.—Foreign States—*cont.*

YEAR.	UNITED STATES.		FRANCE.	BELGIUM.	AUSTRIA.	ITALY.	SAXONY.	SWEDEN and NORWAY.	BAVARIA.	WURTEMBERG.	BADEN.	PRUSSIA.	RUSSIA.	SARDINIA.	PORTUGAL.	YEAR.
	Applications for Patents.	Patents Granted.	Patents and Certificates of Addition.													
1862	5038	3521	5859	1730	612	161	144	82	92	98	38	74	67	—	12	1862
1863	6014	4170	5890	1868	615	229	176	121	91	80	33	71	80	—	15	1863
1864	6972	5020	5853	1753	619	313	125	98	71	89	35	68	56	—	16	1864
1865	10,664	6616	5472	1662	594	277	169	104	93	92	31	65	49	—	18	1865
1866	15,269	9450	5671	1775	526	253	143	129	81	66	40	64	61	—	8	1866
1867	21,276	13,015	6098	2022	709	333	179	128	133	143	46	102	54	—	15	1867
1868	20,420	13,378	6103	2033	775	358	240	146	160	136	57	83	44*	—	11	1868
1869	19,271	18,986	5906	2052	767	395	190	142	119	220	61	53	81*	—	32	1869
1870	19,171	13,321	3850	1523	717	342	164	117	108		69	74	12*	—	23	1870
1871	19,472	13,033	2782	1482	699	376	139	—	88	98	39	37	—	—	17	1871
1872	18,246	13,590	4875	1921	922	521	259	200	164	141	113	56	—	—	—	1872

* The Returns of the Number of Patents taken out for Agricultural Improvements in the Years 1868, 1869, and 1870 are wanting.

*** NOTE.—The above returns, which are from the Patent Office of the United Kingdom, do not quite agree as to Belgium with the returns furnished by M. Carl Pieper, C.E. of Dresden, General Secretary of the Vienna Patent Congress; but the difference does not affect the use made of these returns in the Report.

APPENDIX K.

INCOME and EXPENDITURE of the PATENT OFFICE from 1ST OCTOBER 1852, and TOTAL SURPLUS to 31ST DECEMBER 1872.

Date.	Receipts.			Expenditure.			Surplus.			Deficiency.		
	£	*s.*	*d.*	£	*s.*	*d.*	£	*s.*	*d.*	£	*s.*	*d.*
1st Oct. 1852 to 31st Dec. 1853	72,911	8	6	47,599	12	9	25,311	15	9			
1854	53,864	18	2	63,504	8	6	——			9,639	10	4
1855	74,819	1	4	51,742	11	0	23,076	10	4			
1856	92,477	6	2	65,762	10	9	26,714	15	5			
1857	85,351	2	3	77,749	8	3	7,601	14	0			
1858	84,952	15	6	61,788	4	4	23,164	11	2			
1859	96,804	8	5	46,398	6	3	50,406	2	2			
1860	109,571	18	6	43,833	10	9	65,738	7	9			
1861	102,030	17	0	46,567	13	3	55,463	3	9			
1862	111,729	15	6	47,356	16	1	64,372	19	5			
1863	112,198	18	10	47,655	15	1	64,543	3	9			
1864	110,712	16	2	46,643	0	2	64,069	16	0			
1865	115,340	13	10	46,726	12	9	68,614	1	1			
1866	116,092	8	2	48,942	18	4	67,149	9	10			
1867	114,629	0	6	50,968	5	4	63,660	15	2			
1868	121,311	10	10	54,824	3	5	66,487	7	5			
1869	121,517	11	6	54,652	19	2	66,864	12	4			
1870	116,129	13	10	52,537	19	11	63,591	13	11			
1871	123,133	15	6	53,015	18	9	70,117	16	9			
1872	137,840	9	10	52,229	8	1	85,611	1	9			
	2,073,420	10	4	1,060,500	2	11	1,022,559	17	9	9,639	10	4

	£	s.	d.
Surplus to 31st December 1872 (less deficiency 9,639*l.* 10*s.* 4*d.* in 1854 - - -	£1,012,920	7	5

APPENDIX L.

DEFINITE PROPOSALS for a LAW of PATENTS.

Memorial of the Seniors of the Trading Community at Berlin to the Royal Minister of State for Commerce, Trade, and Public Works, his Excellency Graf von Itzenplitz. Edited by Dr. Werner Siemens. Berlin, 1869. Published by Th. Bittkaw.

YOUR Excellency's ministerial note of 5th August has invited us to an exhaustive expression of our opinion upon the question whether, in the existing condition of industry, it is still necessary to encourage inventors by the award of patents, seeing that the Prussian system of legislation on patents, like the systems of other countries, contains considerable disadvantages. As representatives of a corporation whose trading interests are as important as its industrial, we have made it our concern to submit the question thus raised to a searching and unprejudiced examination, and have the honour to lay before you in the following pages the result of our careful deliberations.

The question may be answered from different points of view. That from which the system of granting patents is usually defended (but, on the other hand, especially of late, it is also attacked) is the moral claim of an inventor to the protection of his intellectual property. It is indisputable that this way of looking at the question has a certain degree of justice in it. Where the productions of active intellect *especially*, e.g., works of art, literature, &c., are protected in a state, for the benefit of their authors, from unauthorised multiplication, and a certain kind of constraint is thus imposed on the whole community, the demand is not unreasonable that a like protection should be extended, as far as possible, over the whole domain of intellectual production, and, in this way, especially, that discoveries in technical industry, which are just as much the accumulated product of applied labour as writings or works of art, are to be not only looked upon, but also to be dealt with, as the actual property of the discoverer. But, beyond all doubt, technical discoveries have a superior claim to protection, because they are founded on expensive experiments, or, at least, have need of them for their practical application, and in this sense must be regarded as a combination of accumulated labour and capital.

In spite of all this we do not feel it incumbent on us to direct our judgment of the matter to this part of it. It is, moreover, doubtful whether the argument of moral right is decisive. *The interest of the whole community is the higher law* to which all individual interests must be subordinated. If it can be shown that the good of the public can be promoted by the abolition of the inventor's patent, then inventors must either be contented with such advantages as they can reap from their discoveries without the protection of patents, or turn their energies to other more remunerative work. We think we do best, therefore, in confining our attention to the consideration and answer of the question, Whether or not it is good for the prosperity and further development of industry (and of commerce the interests of which are inseparable from it) that an exclusive right of property in their inventions be awarded to inventors?

It cannot be disputed that the inventor's patent is a restraint upon industry and commerce, and even in some cases an injury to all the consuming and producing public. The wider the range of protection that the patent affords, and the greater the facility with which it is obtained, and the longer the great mass of insignificant and useless patents remains in legal force, and finally and chiefly the harder it is made by legislation for the public to determine what is legally patented and what is not, so much the greater is the injury caused. But, on the other hand, the phenomenon that the rapid development of industry in different times and countries keeps equal pace with the development of the system of patent legislation, is of such weight that we may not discard the principle of protection with a few common-place or indecisive phrases on the ground that patents are undoubtedly burdensome to the public.

Regarded from the basis of the patent laws of Prussia, and especially of the Zollverein, the connexion of the development of industry with that of protection is not easily perceived. The laws of Prussia and the Zollverein, although much more recent than those of the other great industrial States, have nevertheless restored to the patent of invention its old original character, namely, that of a privilege which is graciously awarded to the inventor as a reward for the merit he has acquired by the discovery. The discovery itself is kept secret in the interest of, and as a reward to, its inventor, and only the title of it is published for a warning to those who may contervene it.

The situation of all tradesmen who desire to introduce improvements into their business in the face of these patents is truly desperate. If the tendency of their improvements coincide with the title of an existing patent, the patent is a perpetually impending uncertain danger to them, for they have no means of ascertaining the contents of the patentee's specification. A formal presentment in the offices of the Ministry of Trade is required to learn whether the improvement they have introduced violates an existing patent or not. In any case they risk falling into a vexatious dispute with the patentee, and expending their labour and money to no purpose. We must consider it a happy thing for our home industry that such secret patents are only granted in comparatively small number, because the technical authority, at whose personal discretion the distribution of patents is left free from all control, is only in comparatively rare cases disposed to grant them. But the system of secrecy observed in Prussian patents involves other evils also which retard the development of industry. Because a royal official only patents such inventions as he considers worthy of this advantage it is natural that among the public the opinion is maintained that all patented discoveries are of great utility and value, an opinion in the rule succeeded by the most bitter disappointment; and, further, when the patentee has satisfied the easily evaded condition of specification of the modus operandi, then the patent remains undisturbed in force with all its obstructive and mischievous effect upon the commercial world until the period of its expiration though it may never be practically applied, and never bring in the least reward to its inventor. But even in more favourable cases the advantages that an inventor obtains from a Prussian patent are nearly all illusory. For one thing, the duration of the patent, usually five years, which likewise depends entirely on the uncontrolled discretion of the technical department, is nearly always, at least in important discoveries, too short to bring them into extensive application and naturalise them in the country. Moreover, the patentee wants a safer legal footing; for the decision, whether his patent has been invaded or not, is still left to the entirely discretionary judgment of the same technical department. Finally, a Prussian patent is nearly always worthless to its possessor from the circumstance that the import of patented manufactures from other States of the Zollverein cannot be prevented. As to patents in Prussia and the Zollverein, therefore, we can only endorse the general opinion that they offer a great impediment to the home industry without the least compensating benefit; and, being just as barren of advantage to inventors themselves, do not restrain them from withdrawing their ideas, talents, and capital from their Fatherland, and carrying them to the more remunerative English or French markets.

If, therefore, the question before us were whether the Prussian patent law in its present shape should continue to exist or not we would not hesitate a moment to declare ourselves in favour of its complete abrogation.

But the question assumes quite another shape if we take into consideration the patent legislation of all the other great industrial States.

In the beginning of the 17th century when the English Parliament abolished the intolerable abuse of individual privileges, we know that it decreed for the future that privileges should only be awarded for inventions, and that under the conditions that the inventions should be made public. This *stipulation of publicity* of the thing patented has passed into the patent legislation of all other great States, with the exception only of Prussia and Russia, and has manifestly contributed in quite a remarkable degree to the rapid development of industry then initiated. Indeed, one has only to look through the index to the register of English patents to perceive what a fund of fertile ideas of immeasurable value to humanity has been established by this means. To this day the specifications of English, American, French, and Austrian patents are almost the only source from which the technical journals of all countries derive their material. To this day the spread of new ideas caused by the publication of patents is the driving wheel that maintains the industry of all countries in its rapid career of development. That isolated countries like Switzerland, which has no patent laws, and Prussia, with its patent legislation in direct antagonism to the conditions of industrial progress, boast, in spite of their defective, or, at least, unsatisfactory system of protection of a similar industrial development to that of the older industrial States is explained by the circumstance that to them as to the whole of the world the patent publications lie open for use, and their progress cannot be urged in detraction from the immeasurable benefits which patents have produced, and are producing, in unvarying quantity to this day.

But the question has been raised, Whether patents, which have manifestly contributed to the development of industry (as in former times the guilds and special privileges did), are necessary now that industry has attained its actual eminence, and have not been rendered superfluous by competition and facility of communication. As an instance of this, it is pointed out that even in England, the birthplace of patent legislation, agitation is directed to its abolition.

Let us grant (as we must if we will not simply repudiate matters of fact) that the unbroken progress of industry is in the present time an inseparable condition for the prosperity of industry and trade. Let us further concede that the rapid dissemination of all ideas and discoveries, even of such as are called unpractical and inapplicable, and thus not immediately beneficial, is the most powerful mainspring of the onward progress of the world; and the question is narrowed to this, *Are there any means more simple and less inconvenient for inducing the originators of inventions to publish them immediately and completely and thereby to make public property of the novel thoughts they contain?*

This question must be answered by a decided negative.

Every inventor naturally wishes and endeavours to make his discoveries (as a rule, the result of long labour, and often of costly experiments) as profitable as possible to himself. If the State accords him no right of property in it, then the publication of his invention is the end of his property. Thus he sees himself compelled to keep his invention as secret as he can in order to use it for his own benefit. If he owns a factory, or has the will and the means of acquiring one, and if the nature of his discovery admits such a course, he will try to work it under the protecting cloak of a manufacturing secret. In another case, he will try to interest another man in his discovery under a promise of silence, and if he succeeds he will begin in partnership with this other to work it secretly. Experience shows that in countries without the protection of patents in manufactures which do not admit of patenting, such secrets are preserved for generations. But by this not only the invention in question is for a long time lost to the world, but all those others also which might have emanated from it in one brain or another.

Many discoveries indeed have finally come to publicity either from the originator himself when his pride has surmounted his egotism, or by the treachery of others; but this would only happen in a limited degree, after a long lapse of time, and in an imperfect shape. A prompt, perfect, and credible publication, such as is obtained by the law of specifications, could be had by no other means. The peddling secrecy so fairly well superseded by the patent laws would thus flourish again, and the lively development of industry of our century would be completely interrupted. *No other means can be conceived for obviating this than those of compelling the originator of an invention to publish it for his own interest, and this is the true and reasonable basis of an effective patent law.* Thus regarded the patent is an actual contract between the State and the inventor; the former as representative of the interests of the community secures to the latter the sole right of disposal of his discovery for a number of years, which is only to be so long as is necessary for the attainment of its object; and the inventor assumes, on the other hand, the obligation of making common property by prompt and complete publication of the new ideas latent in his discovery. It is the duty of legislation to see that the community draw the greatest possible advantage from this contract.

But, apart from that of publicity, society derives other material benefits from conferring a right of property on the discoverer for a limited number of years. It is only in the rarest cases that a new invention can be utilised in its original shape, generally, and particularly in the most revolutionary discoveries, those that depart from the track of things known and tried, a long course of experiments and a great sacrifice of time, labour and capital are necessary to meet every new difficulty as it arises, and give the invention a practically useful form. Nothing but the prospect of considerable gain can furnish a motive for these great sacrifices. By the protection afforded him for a number of years by his patent, combined with that parental affection that every inventor has for his idea, he is made a natural guardian and protector of his invention; if he have not the necessary means himself, his right in his discovery creates them, he obtains capital to carry out the necessary experiments, on the security of a share in the prospective profit. In this manner Watt succeeded by means of his 14 years patent in getting the wealthy Bolton for a partner. It is true that the whole of Bolton's property, and the labour of 15 years besides were absorbed in surmounting the great difficulties that lay in their way, and nothing but the prolongation of his patent for 14 years more by Act of Parliament secured them their merited reward. But, even if they had both of them been ruined, the world would still have had the steam engine, and with it have won the entrance to a new stage of industrial progress such as was never dreamed of before. Similar cases may be endlessly cited in which tenacious perseverance and prosecution of one idea, supported through a long course of years by the prospect of considerable profit in the future, have at last been rewarded by an important discovery imparting new life to an entire branch of industry. Not in the conceptions themselves which often perish unregarded, but in their painful and perfect realisation lies the real merit of invention, and its utility in the world. How frequently have really good proposals left unregarded because they were only proposals, years afterwards been brought to light again or invented anew by a more persevering inventor, who guided the same ideas to the most brilliant results! Who is not reminded of a case in point, in the discovery of the aniline colours which was made in our country many years ago, but only valuably applied in the present day?

It may be conceded that the combined labour of all would attain the same ends in the course of time, even if the inventor himself, by the abolition of patents should be deprived of the impulse, and the means necessary for this difficult and most frequently ungrateful task; but in any case the requisite expenditure of time, labour, and capital would be incomparably greater.

It is objected that during the period of the inventor's separate property in his discovery the community are deprived of its advantages; but, even on this point the inventor's interests rightly understood, are identical with those of the public. The enormous development of manufactures in nearly every branch makes it nearly always far more profitable to the holder of a useful patent to throw open his invention to all who can use it, against payment of a small share of profit or a fixed amount. Only very seldom, therefore, will a patentee be working his invention alone in a country where a secure protection of inventions exists; he will on the contrary be almost always anxious to bring it into general use. The period of the duration of the patent is thus in no manner lost to general industry, the interested branch of industry will, on the contrary, under the protection of the patent law quickly become familiar with the new discovery, whilst in countries where no patents exist every man must make the necessary experiments for himself and thereby have to pay, besides loss of time, a much higher premium of apprenticeship than the fee which the inventor claims. Experience teaches us, almost everywhere, that new inventions are most rapidly introduced where an inventor protected by his patent is labouring to introduce them and opens his own stores of experience to all the world. All who then apply the new invention become co-operators in perfecting it, and the branch of industry concerned thus gains an advance over other countries, which in many cases they regain with difficulty or never at all, and this cause has often entirely ruined many formerly flourishing branches of industry and the trading interests attached to them.

If, in spite of the fact that a patent law (by which the inventor's property in his patent is secured for a term of years on condition of publicity) brings evident advantage to the industry of the country, yet just in that country in which this arrangement has existed the longest, namely in England, an agitation has arisen for doing away with the system,—then we can be sure that some defects exists in the legislation which have increased unnecessarily the inconvenience to the public of patents, and that the result of that agitation will not be the repeal but the reform of the law. England, which owes its great industrial predominance chiefly to the circumstance that it had a law of patents first and long before all other countries, cannot and will not ever abolish the inventor's patent, but it will reform its patent laws. It began to do so already some years ago by adopting the principle of increasing the inventor's payments to the State in proportion to the duration of the patent. By the ancient English laws patents were granted without any sort of scrutiny for one immediate heavy payment, and for 14 years duration. It may be assumed that not more than about 5 per cent. of the patents issued in England have been practically maintained and been profitable to the patentee in their original form. The patents were taken out and paid for once for all, remaining as a burden on the public for the whole 14 years. With the great number of patents issued in England to all the inventors of the world this dead weight must become intolerably burdensome in time. Add to this that English law permits inventors to occupy much too broad a ground with their claims by excluding every possible improvement or application of their invention, or even of any part of it in advance. From this a confusion of claims has arisen in the course of time out of which none but practised jurists can find their way at need. By introduction of the rising scale of duties it has happened of recent years that only a small portion of the patents taken out survive the third, and not more than from 5 to 10 per cent. the seventh year of their existence. A broader reform of the law is nevertheless indispensably necessary for the relief of the public, and in all probability that will be the result of the agitation at present directed against the patent laws.

A similar position exists in France; where also a reaction has arisen against the system of overwhelming the public with useless and therefore troublesome patents. The false economical principle of intellectual property has led the legislature to give too much facility to the prolongation of patents and neglect the application of effectual means for removing the dead weight of the useless ones. Here also the price paid to inventors by the community, for the publication of their ideas and experience and for the sacrifices they bring to the completion and dissemination of their inventions, must be regulated by the laws of supply and demand. The price is too high and must be moderated when the pressure grows too great. But no reason can be found in this for the abolition of the law itself, from which renewed vitality is supplied to all others.

Finally the question would remain for consideration whether it would be possible that Prussia should leave the older great industrial States, and it may be also in the future her present companions in her own irrational secret system in the Zollverein to promote the publication of discoveries by a secured patent protection, and unite herself to Switzerland, Mecklenburgh, and the Hanseatic towns in enjoyment of the benefits of the patent legislation of other countries, without having any of her own. Apart from the odium, one may even say the immorality, of excluding a great commercial and industrial State like Prussia at the head of the Zollverein from a share of the burden that the rest of the civilised world takes up in the patent laws in order to make common property of all new thoughts and technical experience as rapidly and completely as possible,—apart from this, such an isolated proceeding by Prussia would, as we have already shown, entail great material disadvantages. A minor State with an industry limited to a few isolated branches of manufacture might perhaps carry on such a system for a long time without any immediately perceptible detriment; but a great industrial State has to strive for the leadership and at least in some departments must actually attain it, if it will not be continually more and more outstripped. For nothing but the consciousness of superiority or at least of equality attracts capital and intelligence into its service, opens the markets of the world to its manufactures, and attains that secure footing there which is necessary for the struggle with universal competition.

We believe that we have proved in the above lines, that: *inventors' patents with obligatory publication of their purport are an indispensable condition to the growth and progress of industry trade and commerce*: that the greater industrial States or federations of States cannot abolish the patent laws without material detriment; and, that the agitation set in motion recently for their complete abolition is based in part on incorrect views of the real significance of the inventor's patent and its use, and in part and chiefly is *a consequence of the existing defects in the patent laws, and will probably result in their reform.*

In our opinion an efficient law of patents must in the first place promote the rapid, reliable, and complete publicity of the subject of the patent; it must further compel the inventor, for his own interest, to devote his time and resources to the perfecting, practical working, and general introduction of his discovery; it must, finally, enable him to bring other intellectual and material forces into the service of his own invention. But, at the same time, it must prevent the accumulation of an oppressive and publicly injurious mass of untenable and worthless patents. This operation of the law is already in part attained by the introduction of the above-mentioned system of progressive duties; for if an invention is in fact practically worthless, the inventor will soon be apprised of its worthlessness and avoid payment of further—and higher—taxes upon it. Besides this there exists a second available means for the reduction of the burdensome number of worthless patents in an arrangement the principle of which is to be found in the American patent laws. It is this; before its formal preparation and issue every patent applied for is submitted to the judgment of an authority whose duty is to examine into its formal and real validity. Should it appear that the patent is for any reason untenable and a useless burden for the public and the inventor, then the authorities have to advise the inventor to withdraw his application, giving him a short statement of their reasons. If the inventor declines to follow this advice the patent is prepared and published along with the dissuasive opinion of the court. The opinion of the examining authority has in this process no decisive influence on the issue of the patent; the principle of "acting on a "simple notice of application" (*anmeldenverfahren*) remains, on the contrary, in full force; but the greatest drawback to that system is removed by the previous consultative investigation. In most cases the inventor on consideration of the opinion of the court will conclude that he has been in error and withdraw his application. In the other event the notice of the public is drawn to the formal or material defect of the patent by the dissuasive judgment appended, and the patent loses its effect of impeding trade. But the inventor, by bringing an action against any person who contravenes his patent, can obtain a judicial decision of the question whether his patent is sound in form and substance or not; and this deprives the preliminary investigation by the authorities of that character of discretionary power which clings to it when it is finally decisive of the question. The judicial sentence based on the opinion of sworn experts gives to the patentees and the public a sense of security in legal protection; and if, as may be expected, the judicial sentence in most cases confirms that of the investigating authority it serves to increase the influence of the latter. For this object they will only give a dissuasive report where the untenability of the patent is manifest, and in doubtful cases, leave the parties to make their claims good before the judge, who is empowered to summon as many experts as he wishes to his court, and thus has more and more reliable means of arriving at a well founded and just opinion, than a government official can command.

We believe that we may assume that a law of patents resting on these bases will serve the real interests and wants of industry and commerce and especially of the public also so much the more completely as the territory is larger in which it is operative; and we sum up our opinions in the following points unanimously adopted by our "Collegium."—

1°. The system prevailing in Prussia of patents kept secret and awarded on the ground of a previous official investigation we entirely repudiate and we advocate the earliest possible repeal of this law.

2°. On the other hand we regard the award of patents of invention, with unconditional obligation of publicity, as indispensable; and cannot therefore advocate the complete abolition of patents of invention.

3°. We consider the most effective patent law to be one with: award* upon application, consultative preliminary investigation; judicial protection of the inventor as of the public.

4°. We recommend a system of patent fees with a rising scale.

5°. Only in an international patent law (or, at least, one embracing the whole Zollverein) with institutions common to all parties to it, can we look forward to a completely satisfactory settlement of this difficult question and exceedingly important for the further successful development of industry.

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* *Anmeldenverfahren* (?).

THE SENIORS OF THE TRADING COMMUNITY OF BERLIN.
Berlin, 13 October 1863.

(*Translated by J. W. Mollett, B.A.*)

APPENDIX M.

PROJECT of a PATENT LAW by Engineers of the German Empire.

Project of a Patent Law for the German Empire; submitted in a petition to the Bundesrath of the German Empire by the Society of German Engineers.—

The fourth Article of the constitution of the Empire introduces the system of patents as a subject for imperial legislation, and thereby requires the uniform legislative regulation of the system of patents for the whole German Empire. Longer continuance of the conditions which exist at present in the separate states of Germany, and, without consistency and principle, lay the development of manufacturing industry under the greatest disadvantage, is in fact impossible. The patents now granted by the most incongruous rules in the various German States rarely bring any profit to the inventors concerned, and therefore fail to stimulate inventive industry. The duration of the patent, in most cases arbitrarily settled, is too short, and the patent is only operative within the limits of the State that grants it, and not through the whole of the Empire. The patents contribute nothing to the spread of new scientific ideas, because the specifications are generally kept secret, and therefore do not fertilise and stimulate technical progress, but impede it in a high degree, because no man knows what is really patented and what is not. Manufacturers are placed by this in an insufferable position of uncertainty, which reacts injuriously on general trade. It is natural that this evil condition of the German patent legislation has induced a general dislike to patents of invention, and that this dislike is particularly active in Prussia where the patent legislation is indisputably the worst of all.

The Society of German Engineers, therefore, shares with complete conviction the desire that is felt so generally and especially in Prussia that the existing legislation on patents may be repealed as soon as possible.

To the more comprehensive demand, for entire abolition of patents, as publicly injurious and inconsistent with sound principles of social economy, the society is on the contrary most decidedly opposed.

The opponents of patents of invention maintain that they are antiquated privileges, irreconcileable with the principles of sound economy, conferred on individuals at the cost of the free activity of manufacture and trade. They maintain that by patents the prices of goods are enhanced at the cost of the consuming public, and manufacturers are involved in endless disputes at law with the patentees. They deny that patents stimulate inventive activity or advance the publication, completion, and practical application of new ideas. Patents, on the contrary, say they, impede progress, because under the increased facilities of intercourse, the concealment of an invention is impossible without them; because by the general effort a new happy idea is more easily and quickly worked out and applied than it could be by the inventor alone under the protection of a patent. They say that it is only in rare cases that patents are really profitable to the inventor, while he derives a certain advantage over his competitors without them, from the priority which it is his business to maintain by the rapid perfection and application of his idea. They declare that it is impossible to regulate the system by law in such a manner that the public may not be overwhelmed with a flood of useless or troublesome patents, because the only antidote of preliminary investigation has been proved impracticable. They demand accordingly the abolition of patents, because the public injury they do is not compensated by benefit to the inventor, and it is not possible to regulate the principles of their allotment by law in a satisfactory manner.

We perfectly recognise the weight of some of the objections brought forward against patents of invention; but we appeal for an unprejudiced examination of the arguments in their favour, and are firmly convinced that such an examination will show the indispensable necessity of their existence.

The opinion reported to the Royal Prussian Ministry of Trades for 13th October 1863, by the Berlin Aeltester Collegium (a convocation of merchants) and adopted at that time by several other commercial clubs (printed in the Quarterly Journal of Faucher, 1864, Bd. I. page 200) clears up the argument in favour of the continuance of the patent system in a convincing manner.

We entirely adopt the arguments there brought forward. Let the report speak for itself:—

"If you admit—and you must unless you will simply deny relations that are matters of fact—that the uninterrupted progress of industry in the present day is the indispensable condition of the prosperity of trade and manufactures:—if you further admit that the rapid dissemination of all ideas and inventions (even of such as are called unpractical and inapplicable and therefore not directly useful) is the most powerful impulse of the onward progress of the world; then the question is limited to this:—Is there any simpler and less troublesome means for inducing the originator of inventions to publish them immediately and completely, and thereby to make common property of the new thoughts that are in him. This question must be met with a decided negative. Every inventor naturally wishes and strives to render his invention (which is generally the result of long labour and often of costly experiments) as profitable to himself as he can. If the State allows him no property in it, then the publication of his invention is the end of his possession of it. He sees himself by this compelled to keep his invention as secret as he can in order to use it for his own good. If he owns a manufactory, or has the will and the means of acquiring one, and if the nature of his invention admits of it, he will try to work his invention as quietly as possible under the protection of a manufacturing secret; in other cases he will try to get another man to take an interest in his invention under a promise of secrecy, and succeeding in this will join this man in the secret use of his invention. But in this way the world not only loses the invention in question for a long time, but all those other inventions which it might have suggested in other men's minds. It is true that many inventions would in the end be made public by the originator of them, if his vanity exceeded his egotism, or by means of falsehood and treachery; but this will only happen to a limited extent, after a long lapse of time and in an imperfect manner. Such a rapid perfect and credible publication as the patent specification provides could not be obtained in any other way. The secret jobbery that the patent legislation has fairly well put an end to, would start into vigorous life again, and the flourishing and healthy development of the industry of our age would be completely interrupted. There is no other conceivable means of averting this than compelling the originator of an invention to publish it in his own interests,—and this is the real rational basis of an effectual patent law. The patent thus considered is an actual *contract between the State and the inventor*; the former representing the interest of the community, secures the latter in the sole right of disposal of his invention for a term of years only just long enough for attaining the object in view. The inventor, on the other hand, assumes the obligation of making public property of the new thoughts involved in his invention, immediately and completely by publication.

"But other material advantages besides publicity accrue to society from the award of the right of property to the inventor for a limited number of years. An invention is only in the rarest cases useful in its original shape; generally, and especially in the most progressive inventions, and such as are furthest from those hitherto known and tried, a long course of experiments, a great expenditure of time, labour, and capital, are necessary to remove the difficulties that arise in the way of everything new, and to bring the invention into a practically useful form. Nothing can furnish a motive to this great sacrifice but the prospect of considerable profit. By the patent protection for a number of years, supported by that parental love that every inventor bears to his idea, he is made a natural guardian and attorney of his invention. If he has not the means himself, his right of possession provides them, he gets capital for carrying out the necessary experiments on the security of a share of the future gain. In this way Watt succeeded in winning over the wealthy Bolton for his partner, by means of his 14 years' patent. It is true that all Bolton's property, and 15 years' labour to boot, were absorbed in surmounting the greatest opposing difficulties, and nothing but the prolongation of the patent for a further term of 14 years by an Act of Parliament, brought them their merited reward. But even though both had been ruined, the world would still have gained the steam engine, and with it the threshold of a new period of development of manufactures of a brilliancy never imagined before. Innumerable such instances may be brought forward in which by persistent and persevering labour devoted tenaciously through long years to one idea, and sustained by the prospect of future gain, the idea which at first seemed vague and valueless, has been crowned by an important invention introducing new life into an entire branch of industry. Not in the ideas, which often perish unregarded, but in their laborious and perfect elaboration lie the real merit and use of invention to the world. How often have really good projects been made, and left unnoticed, because they were only projects, and brought out again or rediscovered after years by a more tenacious inventor, guided the same thoughts to the most brilliant success! Who is not reminded here, as a case in point, of the discovery of the aniline colours made in our country many years ago, but only utilised in the present day?

"It may be granted that the united labour of all would reach the same result in the course of time, even if when patents were abolished the inventor himself should be no longer led by his material interest or have the necessary resources to this difficult, and, in most cases, thankless task; but in any case the length of time required, and the labour and capital expended upon it, will be incomparably greater.

"It is objected, on the other hand, that during the period of the inventor's sole ownership of his invention, the community is deprived of its benefits. But even here the interest of the inventor, rightly appreciated, harmonises with that of the public. The enormous development of manufacture in almost all branches of mechanics makes it nearly always far more profitable for the owner of a useful patent to throw it open to all to whom it can be useful for the payment of a small share of profit or for a fixed price. The inventor will, therefore, only very seldom be the only worker of his invention in countries where a secure patent protection exists. He will, on the contrary, be almost always anxiously engaged in bringing it into universal application. The period of the duration of the patent is thus in no sense lost to collective industry. On the contrary, the branch of manufacture interested is entrusted with the new invention rapidly under the protection of the patent law, whilst, in countries where no patents exist, every man must enter into the necessary experiments upon new inventions for himself, and thus, in addition to loss of time, has to pay a much higher premium of apprenticeship, than the royalty claimed by the inventor.

"Experience also nearly always shows that new inventions are most readily introduced where the inventor, protected by a patent, works personally for its introduction, and throws open the treasure of his collected experience to the world. All who then apply the new invention, are made co-operative in the perfecting of it, and the branch of industry concerned gains an advance by this over other countries, which is often hardly or never at all overtaken; and, in the last case, has already entirely ruined many flourishing branches of manufacture and important trade interests connected with them. If a patent law, which gives the inventor exclusive property in his patent for a term of years and under the condition of publication, plainly gives striking advantages to the industry of the country, and yet an agitation for the abolition of this practice has sprung up, precisely in that country in which it has longest existed, namely in England, we may be certain in advance that there must be defects in the legislation which have needlessly added to the annoyance of the public by patents, and that the real result of that agitation will not be the repeal, but the reform of the law. England, who owes her great manufacturing preponderance to the circumstance that first and long before all other States, she had a patent law, can and will never abolish the patents of invention, but *she will reform her patent laws.* She commenced this some years ago by adopting the principle of a scale of fees payable to the State, increasing with the duration of the patent. Under the former English law patents were granted for 14 years, without any sort of investigation, against an immediate payment of a considerable sum. It may be assumed that not more than about 5 per cent. of the patents taken out in England have proved practically available in their original form, and been profitable to the patentee. The patents were taken out, and paid for once for all, and for the whole 14 years remained a burden on the public. With the great number of patents granted in England to the inventors of all the world this dead weight grew of necessity intolerably burdensome in time. Besides this the English law permits inventors to give their claims an improperly wide range, and to forbid in anticipation every possible improvement or application of their invention or of any part of it. Out of this a confusion of claims has grown up with time, through which none but an experienced legal expert can find his way at need. By introduction of the rising scale of fees, however, it has come to pass of recent years that only a small proportion of the patents taken out survive the third, and not more than 5 or 6 per cent. of them the sixth year. But in spite of this a further improvement of the law is still indispensably necessary for the relief of the public, and in all probability that will be the end of the existing agitation against the patent legislation.

"A similar condition exists in France, where likewise a reaction has arisen against the overwhelming of the public with useless, but so much the more troublesome, patents. The uneconomical principle of intellectual property has there led the legislature to facilitate the acquisition of patents too much and without provision of effectively practical means for removing the dead weight of the useless patents. Supply and demand must, in this matter also, regulate the price the community pays inventors for the publication of their ideas and experience, and for the sacrifice they make in carrying out and spreading abroad their inventions. The price is too high and must be lowered when the competition becomes too troublesome. But this can never furnish a reason for the entire suppression of the business from which all others derive fresh vigour."

In the award of patents of invention lies the only means of obtaining faithful and effectually clear descriptions of the inventions made. Unless the inventor is compelled to describe the essential parts of his invention intelligibly and plainly, in order to obtain the protection of a patent for the new technical ideas thus described, he will, with rare exceptions, try to realise them secretly. He will only make public the brilliant results of his invention for newspaper puffs or the gratification of his vanity. He will indeed be at pains to mislead imitators, and to keep in obscurity or altogether suppress the points most important for them. How easily this may be done every machinist will testify. Possibly the work of all may be able in the course of time to clear up the intentional obscurity or bring to light the secret of manufacture, but the man who discovers it, or to whom it is betrayed, has then *his own interest* in its concealment; he keeps his knowledge therefore for *himself* and not for the world.

The past and present of mechanical science furnish numerous instances in which important methods of manufacture remained for a long series of years the property of individual manufactories in spite of all the efforts of competitors to learn them or discover them for themselves.

Besides its immediate disadvantage this has the immense indirect one that the ideas involved in those methods are not at work fertilising and stimulating invention in all provinces of mechanics, and thus the advance of industrial activity is retarded.

It is only necessary to turn over the journals of the technical sciences to understand how hopeless the condition of technical progress would be if patents of invention were universally suppressed. It will be found that nearly all the technically useful and really intelligible descriptions of important inventions are drawn from the patent specifications of the countries which possess a permanent patent legislation. Without these progress would be paralysed, and instead of printing, railways, and telegraphs we should have the stagnation of China. Happily there is little prospect that patents will be abolished in the older industrial States, especially in England. Some countries will therefore be left to which, as hitherto, the German inventor can escape with his new ideas as his own undisputed property, in the hope (often futile, it is true,) of finding there the reward he aspires to for his labour.

We shall not lose the patent specification and the rapid technical progress of the industry of the world it has hitherto produced even though Germany should finally exclude herself from the sacrifice that the other great civilised States contribute to technical progress. But we believe that this would be neither decent nor profitable to the German empire, now so high and powerful in rank. Not decent, because it would abandon to other countries the sole charge of one of the most important and general interests of civilisation; and because it is a shame to Germans to have to listen to the reproach of the foreigner that foreign inventions are as free as air in Germany whilst German inventions are protected in the other civilised States; not profitable, because inventors will first resort with their ideas and often permanently settle to work them out and introduce them where they find them protected.

A glance through the catalogues of holders of English patents will detect a surprisingly large number of German names among them, although the great majority of the inventions derived from Germany are taken up by Englishmen "*by communication.*" The course already common with all important inventions is now that the German inventor first secures a patent in England or France and tries to realise it there, and frequently settles down there for the better pursuit of the business. A great deal of the cleverest technical talent is thus withdrawn from our country, and many important new inventions, including some which have reformed whole branches of manufacture and brought them fresh vigour, have migrated from Germany abroad. There they have been developed for a long time profitably and stimulating industry, whilst in the inventor's own country his imitators were still busy with fruitless experiments to surmount the obstacles that nearly always impede a radically efficient invention. Large and unprofitable sacrifices of money and labour are imposed on the country without patents, by the "work of all" at cross purposes, their value nearly always exceeds that which the patentee demands for compensation. But, besides the great and generally irremediable economical disadvantages, the country without patents has to look on while the new industry takes root and domicile in other competing countries. A country without patents will therefore only very seldom reach the head of any branch of industry or maintain that position, it will only benefit by the great revolutionary inventions after other countries have already enjoyed their economical advantages and reaped their fruits. This may be borne without detriment by a country where manufacturing industry is incipient, as Prussia of former days and the German middle and small States, but, for the great and mighty German Empire, with its preponderance of scientific talent and its adult industry, such a position condemning it to perpetual inferiority would soon be insupportable.

For the inconsistency of the existing system of legislation in Germany the promulgation of a patent law is in fact necessary. The principle of protection of so-called intellectual property has been recognized in the German Empire by the law for protection of literary property and works of art. It is hardly conceivable, that in one State works of literature and art should be legally protected from imitation, whilst intellectual work in technical matters is thrown completely open. Inventors already complain with justice of the great wrong; that their inventions, generally the fruit not only of prolonged intellectual labour but also of great sacrifices of time and money, are far more imperfectly protected than the intellectual labours of the literary man and the artist; that their protection is always a matter of favor seldom accorded. If you wish to deprive technical inventions of protection, consistency and the principle of the equality of the protection of the law demand that intellectual property be not protected in *any case.* A fraction of social economists opposed to petitioners, advances in justification of this anomaly that the right of property is more easy to establish in a publication or a work of art. But this assertion cannot be universally maintained, it is often difficult to decide, as to publications and works of art also, upon the existence of a punishable imitation. But the consequence of this great difficulty should not be the entire withdrawal of protection, but should act on the legislative settlement of the mode. The fraction of social economists who aim at the liberation of traffic from all that impedes it, overlook in their zeal (perhaps unconsciously misled by the word patent), that with the liberation of material traffic from the limitations imposed by patents they trammel the free interchange of thought.

While indulging the hope that the Bundesrath will appreciate the importance of the economical and political motives for passing a satisfactory law of patents, we do not ignore the great difficulties that stand in the way of a legislative settlement of the matter. We own that all existing systems of legislation are unsatisfactory,—in fact the improvement of the patent legislation is under consideration in every country,—but we cannot allow that the difficulty of reconciling the interests of free traffic with those of the inventor, can justify the demand for the total abolition of the patent of invention. In the face of a recognised demand this would be tantamount to an act of legislative bankruptcy. This could only be proclaimed when all specialists consulted had declared after a searching study of the matter, the impossibility of finding a satisfactory solution of the question. Whereas the difficulties of the matter in great part consist in the ignorance of the legislators of the technical part of the questions to be settled, the Society of German Engineers has thought to advance the matter by appointing a committee to elaborate, with the help of some friends learned in law, a project of a patent law. The result is the project annexed to this humble petition with preamble. In its preparation it has been sought to mediate disinterestedly between the interests of the producer and consuming public, and the protection that it is necessary to afford the inventor; to limit the latter to the greatest admissible degree; and as far as possible to restrain the superfluity of worthless patents impeding trade.

We conclude with the hope that the Bundesrath may please to grant to the industry of the German fatherland with all speed, the benefit of the legislative settlement of the patent system demanded by the constitution of the confederacy, and with the humble prayer that they will give favourable consideration to the principle of such legislation laid down in the annexed project of the law.

For the Society of German Engineers:

Der Director: Dr. Grashof, Grossherzoglich Badischer Hofrath, Professor am Polytechnikum in Carlsruhe.

Der Vorsitzende: C. Petersen, Hüttendirector in Eschweiler.

(*Translated by J. W. Mollett, B.A.*)

APPENDIX N.

PROJECT of a PATENT LAW for the GERMAN EMPIRE, with a Preamble.*

Compiled at the instance of The Society of German Engineers by their Committee, composed of C. Gaertner, Manufacturer at Buckau near Magdeburg, General Director Wintzer, at Georg-Marinen-Hütte near Osnabruck, and Syndikus Dr. André, Osnabruck, and Dr. Wernez Siemens, and Civil Engineer Ziebarth, Berlin.

Introduction.—The following project of a uniform patent law for the German Empire assumes that the object sought is not merely the establishment of common principles for the award of patents of invention in the separate States of Germany. The nature of the subject demands that the award of patents of invention for the German Empire be uniform and direct by the action of a functionary of the Empire. The grant of special patents of invention in separate States, as hitherto, which only operate within the boundaries of the State where they are granted, would create unnecessary difficulties and make success vain. The project therefore provides that the patents of invention shall be awarded by one functionary for the whole Empire.

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* *See* Appendix O, pp. 461–467, for the "Sketch, &c." of this Project and Preamble.

The protection given to the patentee by his patent is a payment on the part of the State for which the publication of the invention is the equivalent. The chief use of patents is that the patent protection promotes the publication of new inventions. The project gives effect to this idea in different directions. It prescribes, before everything, the complete publication of all inventions for which a patent is sought, and obliges the patent office to provide that new inventions are made as widely known as possible. It hinders the concealment of inventions by the conditions to which the grant of patents is subjected (§ 2).

But if the publication of an invention appears as a counter-payment by which the inventor buys the protection, on the other hand the protection must be so effectual that a sufficient motive for the obtaining of patents is furnished. The protection hitherto granted in Germany is not sufficient for this. To render it effectual it is not necessary to directly forbid the importation of patented wares, but all trading in them must be forbidden. If the purchase and sale of foreign manufactures is permitted while the home manufacture is subject to the patentees' license, there will be a preference in this to the foreign manufacture. For this reason also the existing system of free trade in patented productions is inadmissible.

A good patent law must provide that no needless difficulties lie in the way of the award of patents, as is actually the case in Prussia at this time; but that on the other hand the public may not be overloaded with a superfluity of patents.

The project excludes for this double object, 1st. All consideration of the utility of the invention in granting the patents. The utility of an invention cannot be determined in advance; if the object is a really fit one for patenting the patentee may decide for himself whether the invention will repay him for his time and money.

But in order to prevent by anticipation a superfluity of useless patents the project obliges the patent office, before the application and specification are made public (§ 23), to advise those whose application will probably be unsuccessful to withdraw it (§ 24). This advice will be followed in many cases, if it is not followed, then the publication and further process goes on in order. But to the publication the remark is attached that the patent office advised that the application should not be proceeded with, and such applications as are proceeded with in spite of this are easily distinguished at first sight. Anybody, therefore, who is not interested in looking through the whole catalogue of applications can at once direct his attention to those which the patent office publishes without any further observation. The pursuit of patents for advertising purposes is made impossible by this means. But the State loses nothing by the announcement of any useless applications, because the announcement is in all cases made at the expense of the applicant.

2nd. The project does not award patents gratuitously (this is the case in Prussia at present), but demands payment of an amount. This amount is in the beginning very moderate, and increases by degrees. The experience of other countries shows that such a system of increasing cost does away with many valueless patents soon after the award of them.

3rd. The project provides a mode of proceeding before the Patent Office decides upon the application, by which the general public is informed of the matter and afforded opportunity of objecting. The decision is assisted by this, and by the condition that the object of the patent must be carried out before the patent is granted. It enables the Patent Office, in case the application is without grounds, to refuse the patent, because by the terms of the project the authorities cannot be compelled to comply with an application which they perceive can not be maintained. On the other hand it gives the inventor a *right* to the award of a patent, if the legal requirements are met, and admits therefore of a plaint in law for the award of the patent.

If you compare the functions allotted to the Patent Office by the project under consideration with the process that now exists in Prussia you see that the objection made to the latter (that the functions allotted to the Patent Office are such as cannot be discharged, and that the office is burdened with an excess of responsibility) is removed. The monitory function of the Patent Office before publication is neither difficult nor excessively charged with responsibility; but the final decision is facilitated by the elimination of a great mass of worthless applications which are stopped before they reach that stage by the cooperation of the public, and by the circumstance that the decision is not final.

It is possible that the Patent Office on the system of the project, will *in practice*, when the matter reaches that stage (§ 26), not decide the applications for patents with any excess of severity; as in America and England, where no small amount of discretion is left to the Patent Office, patents are in fact awarded without any particular severity (of scrutiny &c). This, however, is no reason for fearing that a superfluity of patents will arise from diminished severity, because on the one hand a great number of applications, probably more than half, never reach that stage (moreover the necessity of proving that the object of the patent has been carried out and brought into use deters a mass of improper applications), and on other hand the subsequent quashing of awarded patents by law is left open on every side, and the rising scale of fees quickly does away with worthless patents. Finally, the project does not closely follow any existing system of legislation, but is intended to combine the good and useful provisions of the various systems and to reject those which are useless. It seeks especially to indicate the practical parts and here and there is bold to advise a new thing. But this will not be objected to because a servile imitation of any one system of legislation or another is not in place here.

Objects to be protected by Patent, § 1.*

The older patent laws are more or less indistinct in their definition of the objects to be protected by a patent. For instance the expression in the English patent law of 1623, "*any manner of manufacture*" is very indefinite. In the more modern laws more definite expressions have been selected. The Austrian law of 15th August 1852, § 1, says, "an exclusive privilege may be awarded for every new discovery, invention, or improvement of:—

a. A new industrial product,
b. A new means of production, *or,*
c. A new method of production.

unless it comes in the category of unprivileged objects enumerated in the following paragraphs (2 to 5) of the Austrian Ordnance.†

"By a discovery is understood every finding out, even of an object applied to use in former times, but subsequently lost again, or principally of a manufacturing process unknown in the country."

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* *See* Sketch of Project, App. O, p. 461.

† App. W. *post.*

"By an invention is understood every production of a new object from new materials, or of a new object from materials already known, or of an object already known from materials not hitherto employed upon it."

"Every application of a preparation, arrangement or method to an object already known or privileged by which a more convenient result or greater economy is won for the usefulness of the object or the mode of its production, is regarded as an improvement or alteration."

S. 2. excludes articles of food, beverages and medicines from the protection of a patent, and such discoveries, inventions or improvements as are inadmissible to use on grounds of public health, morals or safety, or of the general interests of the State.

S. 3 deals with patents of importation and inventions patented abroad; S. 4 with patents of improvement; S. 5 says:—

"An exclusive privilege is not granted for a scientific principle or a purely scientific theorem, even if the principle or the theorem is capable of direct application to objects of manufacture, but every new application of such a principle or theorem, by which a new production of industry, or a new productive material, or a new productive method is created, may be privileged."

You can compare this with the French law of 5th July 1844, the Belgian of 24th May 1854, and the Italian of 30th October 1859, which are likewise at pains to define the object as precisely as possible, and which are constructed, like the Austrian law, on the principle of award upon application (Anmeldungsprincip).

Article I. of the French law of 5th July 1844 says, "every new discovery or invention in every branch of manufacture endows its orignator with an exclusive right to the beneficial use of the discovery or invention he has conceived. This right is confirmed by "brevets d'invention."

Article II. "As new inventions or discoveries are regarded.

"The invention of new productions of industry.

"The invention of new ways and means or a new application of known means for obtaining a result or a production of industry.

"Article III. The following are inadmissible to brevets:—

"1. Pharmaceutical compositions or therapeutical materials of every kind, which henceforth come under the special laws and regulations ad hoc and particularly the decree of 8th August 1810 in reference to all therapeutical materials.

"2. All schemes and combinations directed to objects of credit and finance."

Article I. of the Belgian laws says:—"Il sera accordé des droits
" exclusifs et temporaires sous le nom de brevets d'invention, de per-
" fectionnement ou d'importation pour toute découverte, ou tout per-
" fectionnement susceptible d'être exploité comme objet d'industrie ou
" de commerce."

Article II. of the Italian law enumerates:—

1. Things produced or cultivated for trade.
2. Tools, machines, mechanical power, arrangement of mechanical parts in combination of every kind whatsoever.
3. A new motory power, or the trade application of a known force.
4. Technical processes or methods of manufacture.
5. Finally the technical application of a scientific principle, provided that it delivers objects immediately merchantable.

These laws are founded on the principle of award on application, (Anmeldungsprincip,) and on that account they require the greatest possible precision of language.

The English law is not founded on the same principle purely, nor is the American. The latter, however, attempts a more precise classification and uses the words "art," "machine," "manufacture."

The Prussian law distinguishes goods, methods of manufacture, and machines or tools.

The distinction between the three chief categories, goods, technical processes, and machines, must be appreciated and adopted in the law. Klostermann has exhaustively proved (Patent Gesetzgebung, page 21), that these are the three categories to be established in treating of patent protection. But the adoption of this distinction in the law is advantageous, because it facilitates the designation of the object with a certain degree of precision.

The first clause takes the Austrian law for a model, because this presents the matter in the clearest and most precise form. But some of the provisions of the Austrian law will have to be rejected and others modified.

The definition of the idea "discovery, invention, and improvement" must be rejected. Such a definition is appropriate not to a law, but to an abridgement. The Germans are not generally sparing of their definitions, though the Romans have taught us of old that "in jure omnis definitio periculosa." In fact the establishment of a perfectly complete definition is seldom achieved, and yet the consequences of an incomplete definition are practical inconvenience and anomalies. To avoid these men distort the true purport of their words to get rid of their impediment. The theory is properly maintained in Germany that a definition laid down by law must be adhered to. But this makes it so much the more necessary to be sparing of them, and confine the legal precepts as far as possible to their proper decretory function, and rigorously exclude from them all scientific exposition.

The precise explanation of the ideas "discovery, invention, improvement," comes in the last category. The catalogue is followed in the Austrian law with the supplementrary phrase "and are in their nature fully capable of patenting."* The scope of the preamble is substantially settled by this, and the application of the law secured within an ascertained area. The scientific explanation of the idea of capability of patenting cannot be dispensed with by substitution of a legal definition, and precisely on that account it is more proper, simply to incorporate that idea in the law, and refer its application to the officials and the judge, who are thus put in a position to prevent any absurdities or trangressions of the natural limits of the patent system. (Cf. Klostermann, a. a. O. S. 10 ffd.) The opening sentence of § 1 would not be actually exhaustive. You may reflect, for example, that a thing must have a marketable value to be patentable. The Belgian law expresses this in the proviso that the object of a patent must be one that can be the object of industry or trade. This proviso does not impose the condition of usefulness of the invention, but it shuts out the patenting of scientific theorems and similar things. Some patent laws expressly except these; in the proposed composition such special provisions are not required.

2. An invention or a discovery to be patentable must produce an independent result. In some systems a singular condition of peculiarity has been laid down. Thus the Prussian regulation of the patent system says, "the mere application of a machine or mode already known to " other objects than those it has hitherto served is not regarded as a " new invention; a patent will not be granted in case the machine or " mode is known as applied or in its nature applicable to similar " objects." Cf. Klostermann, pag. 35 ff, 130 ffd.

3. The result obtained must be a production of industry. The discovery of hitherto unknown natural forces, the discovery of a mineral, is not patentable, but the expression "produce of industry" might create

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* I propose to coin the word patentable in future translations.

some doubt because, *e.g.*, we speak of a mining industry. In this respect also the proposed condition acts as a protection.

If it is considered imprudent that so much be left to conjecture, then let us ask, is it really necessary in this regard to attempt to guide science by the law. This consideration may in fact be set aside until experience has given birth to doubts that it is desirable to remove, or practice taken a direction opposed to that which is desired. But neither of these cases is to be feared. The first is not, because in the project submitted, the centralisation of the patent office is an effectual means of introducing security into the practice, and obviating uncertainty; the last is not, because practice seldom goes far astray from the object that is wanted, unless it is fixed within too narrow limits. But if either case were to happen, it is still more reasonable, to proceed with legislation in the ascertained direction that experience suggests to us, than to look out for all possible byepaths in advance. The more universal the object proposed the less commonly is it attained, and generally as much harm is done as good in the process.

An essential condition of § 1 is that which provides that no regard is to be paid to the usefulness of an invention.

Novelty, § 2.

All the patent laws agree on one point, that inventions to be patented must be new, but their prescriptions do not agree in detail. The French law says, article 31:—"Every discovery, invention, or application " is pronounced not new, which has been made public in France or " elsewhere before the date of the application for a *brevet*, in such a " manner that it can be carried into use in conformity." The Austrian law, §1, last line runs:—"A discovery, invention, or improvement is " regarded as new, if up to the time of application for a privilege it is " neither carried into use nor known by a printed publication within " the Empire." In England everything is held to be new which is not already in use, or published in England. The English statute of 1653 says " which others at the time of making such letters patent and grants shall not use." By this is understood that the patenting is only precluded by a trading use, but this trading use precludes it even if the invention itself is kept secret, whilst on the other hand the printed publication of the specification and the application must have occurred in England. In exceptional cases, when, for instance, the invention has been independently made, but without the inventor's knowledge, had already been made known elsewhere, the award of the patent can nevertheless be made exceptionally. In the 5 and 6 William IV. cap. 83, sect. 2, it says:—" If in the matter of a disputed patent, it is established by the " verdict of a jury that the holder of a patent is not the first inventor of " patented object, but that other persons have invented it before the award " of the patent, or that it had been used elsewhere in ignorance of the " patent, then the patentee shall be competent to come in with a " petition for a confirmation of the patent, or the award of a new " patent which shall thereupon be brought under the consideration of " Judicial Committee of the Privy Council; and if it is shown that " the patentee has acted in good faith as the first inventor, and the " object was not in general use before the award of the patent, then " the Committee is competent to advise His Majesty to confirm the patent " in favor of the patentee, and it depends on His Majesty's pleasure to " do so; but every person who contests the appeal shall first be heard " by the Committee."

In America this circumstance is dealt with in the laws of 4th March 1836, section 15; and 3rd March 1839, sections 6 and 7. In the first we find, " If it appears that the patentee has not been the real inventor or

" discoverer of the patented object, or of a material part thereof regarded
" as new, or *that it has already been made public in print before the*
" *asserted discovery by the patentee, or has been sold with his consent,*
" *or brought into public use before he applied for the patent*, or that
" he has fraudently obtained or demanded the patent for an object which
" another man has invented or discovered, and which the latter was
" engaged in a reasonable way in arranging and perfecting, then the
" party who relies on the fact that the patented object was previously
" invented, known, or in use, shall state in his special pleas the name and
" residence of the person by whom he intends to prove the fact, and the
" place where the invention was already previously known or in use."

The law of 3rd March 1839, § 6, refers to inventions patented abroad, which may be patented in America, if they have not already been made public, or used there before the application for the patent is handed in.

Section 7 says, that if the object of a patent was sold before the patenting (under concealment of the invention) the patent is only to be regarded as invalid in case the invention was abandoned to public use or such purchase, sale, or use had taken place more than two years before the proposal of the patent.*

In the explanations to the Prussian patent of 14th October 1815, which prescribes the newness of the invention, we find:—

"As 'known,' therefore not patentable, must be regarded all that is found in published works, native and foreign, whether they are written in the German or any other language, or already represented either by description or drawing, or, within this country, by models. All things also that the inventor himself has brought to the knowledge of the public, by description, drawing or practical use, are precluded from being the objects of a patent."

In § 1 of the project for an agreement upon the universal conditions to be observed in the award of patent protection to inventions, which was drawn up in 1863, by a committee of the Bundestag (diet of the German Federation) it is said:—

" That is not to be regarded as new, which already (1) is carried into use or operation, or in any other way known, within the jurisdiction of one of the contracting States, without being protected there by a patent; (2) is, without concealment, carried into use or operation, or otherwise generally known in another State; (3) is described or represented by a printed publication at home or abroad in such a manner that it can be carried into use by any expert in conformity.

If we recapitulate the views obtained by the comparison of the above prescriptions we find:—

(1.) That it is necessary to distinguish between printed publication and any other using. With regard to printed matter it is important in what language it is printed. Publication in a European language makes the invention accessible to the German public. The same can not be said of other than European languages. An invention made known in the Chinese language is therefore in Germany not yet "known." The line must be more closely drawn in considering publication not by printing but by other means. In this case it is justifiable to have regard for nothing but Germany. The object of patent legislation is to extend the knowledge of that which is hitherto unknown in Germany.

On this principle the previous using of an invention at a distant place cannot be brought into the scale. This will, however, be a rare occurrence, and, as a rule, an invention brought into use in a civilised land without any intentional concealment will be also described in a European language.

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* These Acts of Congress here referred to have been repealed, and some of the foregoing provisions varied by the Act of Congress, 8th July 1870, entitled "An Act to raise, consolidates and amend the statutes relating to Patents and Copyrights." This is now the only one in force in the United States of America relating to patents.—T. W.

(2.) As the project is intended to counteract the manufacturer's secret, it makes this no impediment to the application for a patent. Whosoever, in spite of this, shall endeavour to preserve his trade secret, instead of procuring a patent and making his invention public in course runs the risk of the discovery of the same thing by a third party who might patent it. But, if on the contrary, the previous secret manufacture was made an obstacle to the award of a patent, the man who preferred secrecy to publicity would be protected against the award of a patent to a third party, and the practice of concealment be thus promoted. That this man who has hitherto used the invention as a secret should not be prevented by the patent from continuing his trade, is reasonable; this principle is expressed accordingly in § 2.

§ 2 does not oblige the functionaries of the Patent Office to take official notice of any transactions in foreign countries; it does not follow that they are obliged to disregard that which is actually within their knowledge of transactions in foreign countries; but they are not presumed as a preliminary to their functions to acquire a knowledge of all publications printed in a European language. Such an obligation would indeed surpass the attainable. It may be asked, whether a provision is to be made, in favour of foreign patentees, that during a fixed term, somewhere about six months, the publication of the invention abroad, in the course of the patenting or application for patent there, may be held not to preclude the award of a German patent. Such a condition is not indispensable because the foreign patentee by timely application can secure himself a German patent without it.

The Subject-matter of Patents, § 3.

The provisions of this paragraph contain positive exceptions from objective patentability. The first of these exceptions falls in with a rule of the Austrian law, and is adopted elsewhere also. The second exception will not be disputed. The scope of the law of 11th June 1870, of authors' right in literary works, engravings and musical compositions is a separate one, and it is self-evident therefore that whatever comes under that law must be dealt with according to it.

The same may be said of the protection of patterns and forms, which to the extent to which it is to be introduced, requires a special act of legislation.

Finally it is obvious that patents will not be granted for anything offensive to morals or the law.

Right and Capability of obtaining a Patent, § 4.

English jurisprudence awards the right to a patent to the first and real inventor. In the law of 1623 it is expressly laid down that patents are to be granted to "the first and true inventor." The Prussian decree of 14th October 1815 mentions as the object of a patent "a new thing "invented by a man's self" (eine neue *selbsterfundene* Sache). The American law of 1836 prescribes in Section 6, that the applicant for a patent must declare on oath that he considers himself the first and original discoverer or inventor. This principle undergoes, in practice a material limitation from the nature of the case. Even where a preliminary investigation is held of the novelty of the object, it can not be pursued beyond this question of the novelty; until the contrary is proved, it must be assumed that the man who is first to apply for a patent for a new invention or discovery, is also the inventor or discoverer himself. But, whereas, under the pure application system, this presumption is converted into a fiction of the law, in the English, American, and Prussian jurisprudence it is left a presumption. Let it be proved afterwards that the patentee is not the inventor, and the grant of the patent can be contested by that means. This principle is adopted in the project. To proceed further in favour of the applicant is unnecessary and unreasonable. On the other hand, the project does not require that a man should be the first discoverer or inventor. This follows of course from the principle set forth in § 2 about previous secret use of an invention or discovery. The English law, moreover, empowers the man who makes an invention independently of another, to apply nevertheless to the Privy Council by a special course of proceeding for the award of the patent. Cases of this kind are certainly exceptional; by the form of § 4, however, such an exceptional clause is rendered unnecessary in any circumstances.

For the man who has made an invention before the applicant or at the same time as he, § 2 and § 28 make provision. He can dispute the patent as inoperative against him, and thus is not affected by the patent protection. Nevertheless, the principle laid down in § 8 of the Prussian decree of 4th October 1815 is adopted in the project.

Whereas by § 23 a consequence of the application for the patent is the publication of the specification, the first inventor will get no patent, if he does not apply in good time for one, but lets another man get before him in the matter; because the requirement of novelty will not be met (§ 2); the first inventor, therefore, has an interest in applying for the patent as quickly as possible. The real inventor can depute the right to make the best of his invention to another man, whether it be because he has engaged to do so, or because he is disinclined to pursue the invention further for his own account. In respect of this, § 4 requires a supplementary clause. This clause would otherwise if it only mentioned the discoverer or the inventor, make it impossible for another man to apply for the patent, even if the discoverer or inventor agreed that the patent should be granted to another than himself. The right of application for the patent would be peremptorily confined to the inventor himself. § 4 therefore places the person, to whom the discoverer or inventor commits the application for a patent, on an equal footing with the discoverer or inventor, and extends to him the presumption which the applicant enjoys; whereby he is relieved of the obligation of proving this circumstance, which is of no importance in itself especially with regard to third parties.

Qualification of Patentee, § 5.

The doctrine of equality between natives and foreigners in the award of patents is becoming more and more prevalent; it would be unjust to deviate from it. But it must be subjected to certain limitations, which in fact are not actually opposed to it. For one thing the foreigner must be obliged to elect his domicile in the country. In that case exceptions might be necessary for reasons of reciprocity, these are therefore provided for. The award of patents is not confined to individuals. It is true that only an individual can be the immediate author of a discovery or invention, but nothing hinders his transferring them to others, and frequently he will be under a previous obligation to do so, *e.g.*, in the case of the servant of a company, so that it is important that no distinction be made in the award of a patent.

Transfer of Interests, § 6.

The question may arise whether the number of persons who can possess a patent among them should be restricted. But the inconvenience that would result from such a condition and the difficulty of its application are too great, and the possible disadvantages it would relieve too small. § 6 therefore sets no limit on their number.

But the public, on the other hand, is concerned in being able to ascertain with certainty who is the holder of a patent. For the officials of the Patent Office this is also requisite. For this reason, every transfer of the patent must be set forth in the deeds and registers of the Patent Office. This can be easily obtained by the provision that in respect to third parties the person who is inscribed in the deeds and registers of the office as the patentee shall be regarded as the patentee until a transcription has been effected. This can, of course, only be effected on the production of original official documents. Similar provisions are incorporated in other laws, *e.g.*, the French and the Austrian laws.

Restriction as to Officials, § 7.

The principle of § 7 is adopted from the American patent laws, and is intended to secure that the members and servants of the patent establishment shall be as free as possible from all suspicion of abuse in the performance of their functions.

Granting and Expiration of Patents, § 8.

(1.) It was necessary to lay down at once in this place the principle that the decision of the award of a patent is an immediate function of the Patent Office. Further explanations will be found in §§ 21.

(2.) The formal act of awarding a patent is made to be its publication in the official paper of the Patent Office. Such an official paper is indispensable, and simplifies the proceeding. Here we must consider that by this means (*a.*) the issue of special deeds of patent; and (*b.*) the announcements in various Government organs, are superseded.

A special deed of patent can, of course, be drawn up on demand; but the binding force of a patent upon the public is derived from the public announcement.

The publication of the patents in the Gazette of the German Bund is not practical, because by such items a paper of that description is deprived of its compendiousness; and if the number of patents were to be largely increased it would be impracticable. Besides, it is not only the announcement of the award of patents that interests the public, but matters of patents embrace a variety of things that require to be made publicly known. Now a person who is interested in patents will find all this better in one special paper all together.

Term of Patents, § 9.

The duration of patents varies in the different codes of law.

In England patents are granted for 14 years, but may, in exceptional cases, be prolonged for further 14 years.

In America their duration is 17 years without possibility of prolongation.

In France patents are made out for 5, 10, or 15 years.

In Austria a patent may be awarded for 15 years.

In Prussia the duration varies from 6 months up to 15 years. In Bavaria the utmost is 15 years, in Wurtemberg 10 years, in Saxony 5 years with possibility of prolongation for further 5 years.

If the patent fees are collected for each separate year, and the continued validity of the patent is made dependent on the payment of the tax, it is most simple and quite as effectual for all patents to be limited to one established period of duration. To leave the duration of the patent within certain limits to the decision of the Patent Office upon the award is, on the contrary, wrong in principle, because the Patent Office, to come to such a decision with justice, must draw into account the utility of the invention and similar considerations. The universal period of duration will have to be settled at 15 years. The determination of such an epoch is, it is true, sure to be more or less a matter of fancy;

but the epoch we select has this in its favour, that it expresses the average of those already arrived at in legislation. If it were chosen less it would in many cases not admit of a profitable application. Frequently many years pass before an invention can be introduced to general use. On the other hand, the exceptional prolongation of patents is discarded.

In England, however, the patentee is privileged, before the expiral of the patent, to apply by petition to the Privy Council for a prolongation. In this it must be proved that the proceeds have not as yet covered the costs of the work nor rendered the inventor any adequate compensation. The patent may then be prolonged, but not beyond 14 years. But instances of this kind are rare, and the machinery that has to be brought to bear upon the right and proper application of this privilege is necessarily complicated. If we would in the same way authorise any prolongation it would be almost inevitable that the decision should be committed to the Bundesrath (Council of the German Confederation), which would then have to institute an inquiry into each particular case upon its merits. This would leave the public always in a certain degree of uncertainty, however rarely the prolongation were actually granted. We discard it therefore.

Patents of improvements can be granted (by § 1) as independent or as supplementary patents. If the holder of the principal patent wishes to take out a supplementary one, he has the advantage of paying a diminished fee for it; on the other hand, its duration in that case is limited to that of the principal patent.

Fees on Patents, § 10.

Patent dues vary a good deal. In England the dues are:—

	£						
(1.) For the patent:—							
Handing in the proposal - -	5						
Certificate of the proposal upon proceeding - - -	5						
Completion - - -	5						
Sealing - - -	5						
Specification - - -	5						
Total for 3 years -	25	or ca	166	thalers	20	sgr.
(2.) For addition period of 4 years -	50	,,	333	,,	10	,,
(3.) ,, ,, ,, 7 ,,	100	,,	666	,,	20	,,

In America the tax for the entry of an application is 15 dollars; for the patent, 20 dollars; total, 35 dollars.

In France 100 francs must be paid every year, therefore for 15 years 1,500 francs. In Austria the annual costs for the first five years are 20 florins; for the second period of five years, annually 30 to 50 florins; for the third period of five years, annually 60 to 100 florins.

In Prussia no tax is imposed, but only a small fee for stamps. In Saxony, for the first patent, including stamps and fees, 27 thalers; for the prolongation for 5 years, 48 thalers. In Bavaria, for the first 5 years, 5 florins a year; for the last 5 years, 20, 30, 40, 50, and 60 florins.

In settling a system of patent fees we hold that the principle must be that all expenses whatsoever that the State incurs by the patent system must be fully reimbursed by the fees collected for the patents, and also that the patent functionaries are put in a position to spread abroad as widely as possible all the information about new inventions that they derive from the system. On the other hand, that the patent fees, at least in the beginning, may be small, but gradually be considerably increased. By such an increase the patentee will not be unreasonably inconvenienced. If, for example, after the expiral of nine years, a payment of 100 thalers seems to him excessive for the tenth year, the patent is really too little value to deserve any further consideration.

Too low a scale of fees overwhelm the Patent Office with useless applications, and incommode the public by the number of patents.

Let it be remembered that German patents afford protection throughout an empire of 40 millions of inhabitants, and the proposed fees cannot be considered unreasonable. The scale is purposely so regulated that it increases gradually in order that patents which are of no real use may be abandoned by the patentee. The English practice shows that this means is effectual, for after three years about two thirds, after seven years about nine tenths, of the patents are abandoned in that country.

It is not easy to make out a calculation of the probable result, because it cannot be known how many patents will be granted nor how long they will remain in force. But the fees will probably produce enough to suffice for the proper remuneration of the officers, and to cover the other expenses of the Patent Office.

Expiry and Extinction of Patents, § 11.

The two cases first laid down in § 11 of the extinction of a patent require no justification.

The extinction of a patent by a judicial sentence is provided in § 11, and dealt with in detail in § 28.

Numbers 2 and 3 are the natural results of earlier clauses, but are mentioned for the sake of completeness.

The especial mention of an abandonment in No. 4 is necessary, because it may happen in fact that the patentee have an interest in avoiding inconvenience by abandoning his patent. The model of the document to be sent in to the Patent Office will have to be provided.

In No. 5 the Patent Office is authorised to cancel the patent if the invention for two successive years have not been brought into use. Similar conditions exist in many cases.

In France it is laid down in Article 32 of the law of 5th July 1844 :—
" (2.) The patentee loses his right if, in two years from the date of the " patent, he have not brought it into use; or if he have discontinued " the use of it for two years, unless he gives a justification of the " motives of his inaction."

In Austria, says § 29 of the Austrian law of 15th August 1852, under 2a, the patent expires, " if the patentee have not begun to make " use of his discovery, invention, or improvement within the empire, " within one year from the date of the issue of the patent, or if he " have entirely discontinued this use for two completed years."

By Prussian law, the patentee must make use of the invention, at most within six months; but the Trade Ministry frequently extends this grace to 12 months, and at the same time provide, for the case that the carrying out of the patent be interrupted for a complete year, that it becomes inoperative then.

In England this cause of invalidity is not admitted; in North America it is confined to foreigners.

The grace of two years, in our opinion, may be adopted from the French law. The patent, by § 26, may not be awarded until the invention has come into use, and No. 5 must therefore be worded in such a manner that it meets the case of subsequent continued abandonment.

In the French law we find the condition that the patentee, if he himself imports patented goods from abroad, forfeits his patent. This condition is plainly intended to benefit the home industry. Under the above provision it may be dispensed with.

Patent Authorities and Expenditure, §§ 12, 13, 14, and 15.

The necessity of one sole patent office for the whole of the empire has been established in the introductory remarks. It is equally necessary that the legal judgment of patent questions be centralised. The best plan will be to give it to the Imperial Upper Court of Commerce.

It is without doubt advisable that some of the members of the Patent Office be experts, at the same time it is not superfluous to give precise expression to this principle.

The fees and costs which are collected on patents are to be applied to the expenses of the patent system. Salaries, charges for printing that fall upon the exchequer, and other necessary expenses will probably leave a not inconsiderable surplus. This surplus will have to be applied to arrangements similar to those in force in England in connexion with the patent system. A museum, open to everybody, of inventions and discoveries where that which is really interesting and important is exhibited, affords no doubt an important incentive. Little has been done in Germany hitherto to this end. The reform of the patent law is the means of advancing effectually in this direction.

Since, on the other hand, the importance of the patent system consists in that which has hitherto been characteristic of the process of the German States, namely, in the publication and utilisation of inventions, in the extension of the knowledge of them; it is most peculiarly the duty of the State to make the patent system useful in this direction. Without patent protection every attempt to approach the English arrangement for spreading the knowledge of inventions would be shipwrecked on the expenses. It could not, clearly, be attained with the same expenditure of money, because the materials would be wanting. But quite apart from this lack of materials the costs alone would prevent this way of advancement of progress by technical science. Patent protection makes technical science independent, and obtains from technical science the means of promoting it in the process.

The functions of the Patent Office include the management of the whole of the system of patents. The law has only to decide disputes.

If the law were invoked at once upon the award of the patent and the Patent Office limited to the position of an administrative office of the State, the process would be very complicated and expensive. Such an arrangement would tend to disturb the law from its position of a functionary pronouncing justice between contending parties, and its necessary consequence would be that the legal decision pronounced before the award of the patent would be final. But this very character of finalty in the decision is dangerous. The project, still leaving the decision of questions of results to the ordinary processes at law, hereby avoids, in respect to conditions that might first come to light in practice, the creation of a prejudice by any final decision made before they are practically experienced.

Notifications of Patent Office, § 16.

It must be important to the public to be able at any time to ascertain what patents are still in force. This is materially facilitated by an annual resumé to be published, the preparation of which will have no difficulty for the Patent Office.

Special Experts, § 17.

Although the requisite special knowledge of the various branches of industry is represented among the members of the Patent Office, yet this special knowledge cannot, in the nature of things, be equal in every speciality. The Patent Office must, therefore, be in a position to supplement itself at pleasure in the speciality under its consideration, without, however, conferring on the experts called in for this any claim to a right of deciding. But it is necessary to make this provision explicit, because the Patent Office must be in a position to charge the Exchequer with the expenses arising in consequence.

Power of German Confederation, § 18.

The particular regulation of the course of proceeding in the Patent Office is purposely avoided in the project. On one hand it would be necessary to carry the provisions too much into detail, on the other, it is requisite to adapt these provisions chiefly to meet practical wants, therefore to leave them to be developed by the practical want.

Functions of Supreme Court of Commerce, § 19.

The Supreme Court of Commerce of the Empire has the jurisdiction in cases falling under 1, 2, and 3 of clause § 20 summarily; in other cases it follows the precedent by analogy of its jurisdiction in matters of commerce as supreme court.

It is desirable for the sake of the rapidity and certainty of the process to submit such questions as arise under 1, 2, and 3 of § 19, at once in the first instance to a centralised authorised. The ordinary courts would generally find a difficulty, for want of experience, in deciding such questions, and an uncertainty of judgment would result. This disadvantage cannot be altogether done away with by appeal, to say nothing of the expenditure of time and costs involved. If, therefore, the Supreme Court of Commerce of the Empire did not exist, a special court for the trial of questions of patent would have to be established. But as it is impossible to anticipate at this time the extent of the business that will arise for the courts, we can dispense, at least for a time, with this, and also refer those matters which would have to be decided summarily by the patent court, to the Imperial Supreme Court of Commerce. If, however, an appeal in such cases is determined upon, another method might be found. In the meantime the nature of the case does not necessitate this; substantially it is much more advisable to deal with these matters by summary proceeding, just because it is an object to establish precedents for their decision by frequent application of the law. The patentee's right, to be useful, must be converted by the law court into a right by usage. The function of a court of appeal on the contrary lies rather in the administration of the lex scripta. For this reason, especially, a court of appeal is not desirable in this matter.

Directions as to Proceedings before Supreme Court, § 20.

A few fundamental rules for the proceedings of the Imperial Supreme Court of Trade cannot well be dispensed with.

If we had a general code of civil process already that might be applied; but since such a code will no doubt be issued it is so much the safer for us to confine our remarks in this place to that which is most necessary.

To prevent misunderstanding, it must be observed, with respect to No. 1 of § 20, that the parties to the suit before the Supreme Court of Commerce must be represented by an advocate domiciled at the place where the court sits; that this involves no restriction in reference to pleading at the trial.

For the proceedings before the Supreme Court of Trade sitting as Supreme Court of Appeal (§ 19, 4,) no particular rules are required; although by § 19, 4, the jurisdiction of the court is extended; the proceedings are regulated by the law of 12th June 1869.

The immediate deposit of a complete specification is necessary. 'It may be objected that the inventor requires a certain time to elaborate his invention, and that he is to some extent interested in securing the priority at once. But this objection is unfounded. An invention has no claim to consideration before it has been worked out, and so far completed that it is ready for use. Up to that time it is a crude idea. Besides, the inventor can protect himself; he can take the necessary measures for himself to keep the secret until he has worked out his invention. In any case it is not the business of the State to assist him in this.

On the other hand, it is of great consequence for the Patent Office to be kept free from crude things, and that the matter be presented in a completed form. If you proceed otherwise you will fall into such difficulties as arise in England. In that country the system of caveats and of provisional patent protection on the ground of incomplete specifications and a temporary concealment of them have led to serious difficulties. Unless the complete specification be immediately deposited and published nobody knows precisely what they are dealing with; a science is made of the choice of equivocal expressions by which third parties are led into difficulties unjustly.

Petitions for Patents and Proceedings, §§ 21, 22, 23, 24, 25, 26, and 27.

§§ 22 to 27 contain the measures that are characteristic of the "project." They do not in § 27 altogether abandon the principle of preliminary investigation, but depart altogether from the Prussian system in the following points :—

(*a*.) The Patent Office institutes a consulative preliminary investigation before publishing the application and the specification. (§ 24.)

(*b*.) The decision of the Patent Office is preceded by a complete publication of the application and the specification. (§ 23.)

(*c*.) The object of the patent must be carried out and brought into use in Germany before the definitive application for the patent can be made. (§ 26.)

The publication of the application is not combined with a provisional protection; that would be incompatible with the third condition (above, *c*) and involve other inconveniences. This doubtless puts the inventor in the position that third parties have the use of his invention for a given time. But as the speedy award of the patent is to be expected this will probably only be taken advantage of to a limited extent. If the invention becomes known in the meantime it is beneficial to the patentee afterwards so long as his patent lasts. But the proposed regulation is a motive, on the other hand, for the applicant to expedite the business as much as possible.

Both conditions serve to assist the decision of the Patent Office; the last especially will serve to keep off worthless or nonsensical things.

The system of consultative preliminary investigation has been highly recommended long since. The first condition (*a*) takes account of this system. By it the Patent Office is obliged, if it considers the invention unfit for the successful prosecution of the matter, to give the applicant the advice to abandon his application, and if he insists on the grant of the patent nevertheless to publish the application, but in that case to declare in the publication of it that it is opposed to the advice of the Patent Office.

This proceeding of the Patent Office is not subject to the difficulties by which the proceedings of the authorities under the Prussian system are beset. The nature of the advice excludes that high degree of responsibility which is joined to the existing system of immediate and and final decision. Even if it happened in a case to which the dissuasive advice would have been proper that the application were published without that remark no great harm would ensue. If, on the contrary, the advice is given without cause, the applicant is not substantially damaged by it; he is not prevented from prosecuting his application.

§ 25 is intended to facilitate the investigation of foreign patents.

By § 26 a decision of the Patent Office upon the award of the patent follows *later on.* The reason that the project does not in this case follow the system of award upon application is that the award of a patent sets the public at issue with the patentee, and the law refuses to compel the functionaries of the State if they are convinced of the injustice of the application, to put the public, in spite of this, in the position that they have to bring actions at law against the patentee.

In fact the obligation peculiar to the rigid process of award upon application of awarding the most absurd patents is a very important drawback which has often been pointed out upon this system. This drawback is avoided in the "project." But yet it does not in any wise consent to represent the patent as a matter of favour and free will, and for that reason opens the legal process to the applicant if the patent is refused him unreasonably.

Right of Action against Patent Office, § 28.

This does not impede the decision of the Patent Office, but assists it. The Patent Office, in the knowledge that its decision is not infallible, as in Prussia at present, can perform its task with much greater freedom of judgment. If its decision were to be rectified by the law court, which however could not happen often, the Patent Office would be in no worse a position than any other office of State whose proposals are rejected by the law. Its position is not detracted from by the possibility of such a rejection, nor by the actual occurrence of such cases, nor will that of the Patent Office be in danger from the possibility of the intervention of the law. On the contrary it will be made more free and unembarrassed.

This 28 requires no special explanation. It is justified by the whole system of "the project" and by the preceding remarks.

Protection of Patents and Rights under, §§ 29, 30, and 31.

We have observed in the introduction that the protection hitherto afforded by patents in Germany is inadequate; departing from the custom of most other countries it does not include the prohibition of trade in the object patented. We are not speaking of the importation. The importation of patented objects cannot be directly prohibited; but such a prohibition is unnecessary. If a person buys patented objects abroad and without further infraction of the patent brings them home, the transaction is scarcely worth considering.

In the report of the Royal English Commission, 29th July 1864, we find under No. 7 that the Government is to have a right to use all patented inventions with or without the consent of the patentee against a reasonable compensation to be regulated by the finance minister. This condition is indispensable for the Government and for the War Office and Navy. They could not be left dependent on the consent of the patentee in the event of the invention becoming necessary for the use of the army and navy in time of war. But we cannot define necessity, and it is quite impossible to make any distinction between war time and peace. Such a limit is therefore not drawn, but liberty of action is left to the discretion of the Government. At the same time it is provided that the patentee must be subsequently compensated. The settlement of the compensation by the Patent Court is probably the most equitable mode.

One might very easily be induced to generalise the principle involved in this clause, either in the direction of conceding a right of appropria tion for the public good to the State, or in that of the right being given to all persons of using the patent for a reasonable payment to be settled by law. The last would indeed be the fittest way. It may be the object of a future treatise to promote in this direction a further reconcilement of the public interests with the inventor's right. For those who will undertake this task the jurisprudence of the subject is easy.

Infringements on Rights of Patents, §§ 32 to 39.

The clauses 32 to 39 are adopted as closely as possible from the law of copyright, though the provisions of that law do not apply on all points by reason of the difference of their object.

1. The infliction of a public penalty is not intended. By § 35, however, the court is empowered in case of condemnation to threaten the defendant with a penalty for a second offence; but this penalty follows the principles of the proceedings and requires no further settlement here.

The pecuniary penalty contemplated in § 32 has the character of a private penalty and enables the court to take into proper consideration the circumstances of the case. The estimate of the damage by the judgment of the court is not enough for this purpose; in spite of the liberty of judgment allowed to the court in § 34 the question is still to be steadily kept in view of the real extent of the damage sustained. But cases may arise in which it is requisite to go beyond the damage really sustained, and § 32 makes this possible.

2. In the same way no special rules are wanted as to the participation in, or exciting to, infringement of the patentee's rights. In this respect the general principles of the civil law are sufficient.

3. On the other hand the condition is adopted from § 18 of the law of copyright; that if the "author of the imitation" is not guilty of any crime he is only liable for the amount of his gains. Only this is expressed in the same manner as in the law of copyright, in the second note respecting immunity from punishment, viz., that this immunity comes in force if the person who has infringed the patentee's rights acted in good faith upon an excusable misconception of the facts or the rights of the matter.

4. The destruction of the wrongfully-manufactured objects, or, as the case may be, of the manufacturing material, is not set forth as the necessary consequence of the condemnation, but left to the court to order in separate cases on reasonable grounds.

5. The introduction of experts will no doubt be made the subject of a general arrangement in the forthcoming German code of rules for proceedings at civil law, so that if the code already existed § 38 could be expunged, but as this is not yet in force a clause has been adopted from § 30 of the law of copyright.

6. The rule that the plaint must be made independently is harmless, because the thing it prescribes is advisable for itself, so that it would seldom be departed from in any case; but it is necessary or at least very desirable to elucidate in advance the competence of the Patent Court of final appeal and to avert complications.

7. The rule of obsolescence corresponds with § 33 of the law of copyright.

(*Translated by J. W. Mollett, B.A.*)

APPENDIX O.

SKETCH or DRAFT of a PATENT LAW for the GERMAN EMPIRE.

OBJECTS TO BE PROTECTED BY A PATENT.

§ 1.

Objects to be protected by a patent are:—

(1.) Productions of industry;
(2.) Methods to produce such;
(3.) Machines, utensils, or tools;

provided that they are newly discovered or invented and admit of protection by a patent. Their utility is of no consequence in this regard.

For alterations of such objects, provided that they appear to be independent new discoveries or inventions; patents for improvement are granted, either as particular or additional patents.

Only particular patents can be granted for such objects as are not to be considered as adherent parts of *one* invention.

§ 2.

A discovery or invention which before the solicitation of a patent has been made known by being printed in a European language, or within the German Empire by an open use or otherwise in such a manner as to be completely constructed according to that knowledge, is not to be considered new. Any secret use of a discovery or invention is, on the contrary, no obstacle for being patented, but grants the right to continue that use like before. (*See* § 28).

The patent authorities are not obliged officially to direct their attention to proceedings without the boundaries of the German Empire.

§ 3.

A patent cannot be granted,—

(1.) For articles of food, beverages, or medicines.
(2.) For anything falling under the law of June 11th, 1870, concerning the author's right in books, engravings or cuts, musical compositions, just as little for any alterations of the outward shape of articles (patterns and forms).
(3.) For discoveries or inventions, the execution of which should be forbidden by decency or the laws.

RIGHT AND CAPABILITY OF OBTAINING A PATENT.

§ 4.

A discoverer or inventor who before all others in due manner applies for a patent, has a claim to it. He can leave it to a third party to make the best of this claim. He is not obliged to prove, that he is the discoverer or inventor, or that the claim of authorship is transferred to him by such a one, provided that the discovery or invention is new.

§ 5.

Patents can be obtained by individuals as well as by corporations, and, generally speaking, by any subject or subjects enjoying the protection of the laws. Foreigners for this purpose have to choose their domicile within the German Empire; the council of the German Confederation can however arrange otherwise from reasons of reciprocity.

§ 6.

Patents granted can be transferred entirely or in part between persons living, or on account of the death of a former possessor. The transfer of a patent to another person, not registered at the Patent Office, cannot be effective with regard to third persons, before a transaction has been publicly proved by documents at the Patent Office, and the latter subsequently has effected the necessary transcription in the respective register.

§ 7.

Members or officials of the patent authorities cannot obtain patents otherwise than in consequence of a patentee's dying.

GRANTING AND EXPIRATION OF PATENTS.

§ 8.

The granting of patents is effected by the Patent Office by means of a publication in the official paper of the patent office. The patent will be in force with the 14th day after the expiration of that day, on which the paper containing the grant has been given out at the seat of the patent office.

§ 9.

Patents granted by the Patent Office are in force during 15 years, additional patents for as long a space of time as the principal patent.

§ 10.

A fee has to be paid for the protection by a patent. This fee is 10 thalers for the first year, not including another fee to be paid for entering the announcement. Before the expiration of the first year a fee of 20 thalers has to be paid for the second year, and before the expiration of every following year a fee has to be paid for the year coming next, which fee increases annually by 10 thalers.

It shall not be permitted to pay the fee more than six months before the beginning of that year in which the fee paid is to ensure the protection of the patent.

For additional patents one single fee of 10 thalers has to be paid, but no other beside that for the principal patent.

§ 11.

A patent expires:—

(1.) By a judicial sentence declaring it to be void (*See* § 28).
(2.) After the expiration of the space of time, for which it has been granted.
(3.) With the expiration of that time, for which the patent fee has been paid, in case the fee for the following year is not paid in due time.
(4.) By renunciation declared in writing by the patentee.
(5.) By decree of the patent office, if the discovery or invention has not found any application during two successive years after the granting of the patent for the German Empire.

PATENT AUTHORITIES.

§ 12.

Patent authorities are: the Patent Office and the Imperial Upper Court of Commerce. The Patent Office has its seat in the same town with the Imperial Upper Court of Commerce.

§ 13.

The members of the Patent Office are nominated by the Emperor, to whom respective proposals are made by the Council of the Confederation. The nomination of the necessary under-officials is made by the president of the Patent Office.

It is required that one half of the members of the Patent Office be versed in one or the other branch of industry.

§ 14.

The expenditure of the patent authorities is furnished by the Imperial Treasury. All the officials being employed they are paid from the Imperial Treasury.

§ 15.

The Patent Office has,—

(1.) To decide with respect to the granting or revoking of patents, according to a nearer specification of this present law, to guard the public interest in all patent affairs, and to represent it before the Imperial Upper Court of Commerce.

(2.) To keep the necessary registers of solicitations for patents, their grantings and their durations.

(3.) To give those certificates and attestations, required for private interests, and based on its official knowledge, to the effect, that they have the same force of evidence with public documents.

(4.) To care for the preservation of all the documents, descriptions, drawings, models, papers, &c. referring to the patent department, also to enable the public to obtain a knowledge of the descriptions, drawings, and models.

§ 16.

The Patent Office publishes all notifications in the official paper of the patent office. Every year is to be added to the official paper a list containing the patents still in value, briefly stating their contents and the date of their granting.

The expiration of patents is as speedily as possible to be announced in the official paper.

§ 17.

The Patent Office is empowered to consult competent judges, if required, but is not obliged to follow their advice.

§ 18.

The Council of the German Confederation is empowered to arrange the official proceedings of and within the Patent Office, under observation of the articles of this law.

§ 19.

The Imperial Upper Court of Commerce decides:—

(1.) On dissensions with respect to the granting of patents, their invalidity and expiration.

(2.) On dissensions between different patentees concerning the spheres of their respective rights.

(3.) In the case of §. 31 referring to compensations to be conceded.

Further as highest court:—

(4.) In all dissensions arising on the subject of patent protection, with the sanction as highest court, as specified in §§ 12 and 13 of the law of June 12th, 1869, which law has the object to institute a supreme court of commerce.

§ 20.

Concerning the cases as mentioned in § 19, 1, 2, 3, the following directions are to be observed in the proceedings before the Imperial Upper Court of Commerce:—

(1.) The contending parties must be represented by a solicitor or advocate, being licensed for practise, and living at the seat of the court; the Patent Office may be represented by one of its members.

(2.) The proceedings are public and by word of mouth.

(3.) The court is empowered to gather itself, by one of its members, or by requisition of the ordinary courts of justice, all such evidences as seem conducive to an elucidation of the matter. The court is not bound to follow the advice of competent men whom it may consult, and is empowered to consult at discretion.

(4.) The court states the matter of fact according to its free conviction, as it proceeds from the transactions, without being bound to positive rules concerning the effect of the evidences.

(5.) The court is empowered to condemn any succumbing party, the patent office excepted, to pay the expense of the proceeding entirely or in part, and to the advantage of the adverse party.

(6.) The required public summoning of the parties to assist the proceedings before the court, is effected by the official paper of the Patent Office. A summons may, however, also be published by other papers besides.

(7.) The proceedings as such are regulated by a prescription to be drawn up by the court, and to be presented to the Council of the Confederation for receiving its sanction.

PETITIONS FOR PATENTS AND PROCEEDINGS CONCERNING THEM.

§ 21.

Parties petitioning for a patent have to do it in writing and in the German language, and to present it to the Patent Office in two copies. The one copy is returned to the petitor, after a notification of the time of presentation has been added to it.

The petition must state the subject of the patent as accurately as possible, but briefly. Besides a fee of five thalers has to be paid for the examination of the petition.

A description in German must be added to the petition, which description exhibits the object, for which the protection of a patent is demanded, so completely and clearly, that any competent person is enabled by it to execute the object to be patented, and distinctly places in evidence the points declared to be new.

Drawings, models, or patterns are to be added to the description if required for clearness' sake.

§ 22.

If a petition for a patent does not correspond with the formal prescriptions, the Patent Office gives an answer which states the deficiencies, and requires their removal within a given time. If this removal effected within the time given, the priority of the original petition is preserved.

§ 23.

A petition for a patent being formally correct, is printed by the Patent Office in its official paper. Added to this the description and drawings are to be printed and to be sent to the respective authorities as forming a part of the official paper.

The authorities mentioned are bound to allow anybody, and without expense, the taking notice of the objects in question. Everybody may also obtain a copy against compensation for the printing costs, or, if the store is exhausted, a written copy against pay for the copying.

The petitioner for the patent has to pay the costs for printing his petition and additional papers, as far as they are destined for authorities. A given rule has to regulate this point.

§ 24.

In case the petition for a patent is not fit for promulgation, according to the opinion of the Patent Office, the latter is bound, before the promulgation (§ 23) to advise the petitioner to withdraw his petition, and to fix a certain space of time, within which the petitioner has to declare, whether he wishes to uphold his petition. If within this space of time the petitioner declares his intention to maintain his demand, the further proceedings take place according to § 23, but the publication of the petition for a patent is accompanied by a declaration, that the promulgation of the petition takes place against the advice of the Patent Office.

§ 25.

The petitioner for a patent is allowed to demand, on presenting his petition, a delay of the publication of three months. The petition notwithstanding dates from the presentation.

§ 26.

Three months, and at the highest six months after the publication of a petition for a patent in the official paper, the petitioner has the right to demand the granting of the patent, paying at the same time a fee 10 thalers. In doing so he has to prove to the Patent Office, that the object of his petition has been executed within the German Empire and come in use. The Patent Office can in particular cases prolong the space of six months into eighteen months at the highest.

The Patent Office has to decide on the petition for granting a patent (conf. however § 28), and has either to refuse or to grant the patent. Everybody has a right to present to the Patent Office reasons against the admissibility of the granting, reasons which may be of influence on the decisions. The Patent Office can make researches deemed necessary for its decision, or require of the petitioner the adduction of proof, or the removal of deficiencies.

§ 27.

The possessor of a patent is bound to furnish the Patent Office, if required, with proofs of the continual validity of his patent.

ACTIONS TO BE BROUGHT IN FOR GRANTING OR ANNULLING PATENTS.

§ 28.

An action may be brought in against the Patent Office, if without a legal reason it refuses the granting of a patent or withdraws its protection.

The Patent Office is empowered for the public benefit to bring in an action, to the effect to annul a patent granted.

Everybody finally may bring in an action toward annulling a patent granted. A verdict is found in favour of the complainant in this latter case, if it becomes evident, that the patent ought not to have been granted at all, or that the complainant has made earlier or at the same time the discovery or invention, for which the patent has been granted. This decision has the consequence, that the patent remains inefficacious with regard to the complainant.

The Patent Office can adhere to the action of a third party, and in the same process demand the general annulling of a patent.

PROTECTION OF PATENTS.

§ 29.

The protection of patents stretches as far as the exclusive production or execution of the object of a patent or the dealing in it; with machines, utensils and tools, as well as with methods of fabrication of productions of industry, also as far as the exclusive use for industrial purposes.

To enforce the protection of a patent within the limitations of the law, is solely left to the possessor of a patent, whatever he might hinder, he may allow with or without limits, and beforehand engage to do so.

§ 30.

Patents granted for improvements in objects already patented do not include the right to execute what is already patented.

§ 31.

The possessor of a patent is—

(1.) Not entitled to forbid the use of his invention on the part of the German army and navy; the latter, however, are obliged subsequently to pay a compensation for the use of the patented invention, which compensation is to be estimated according to principles of equity by the court for patents.

(2.) The right of a possessor of a patent, to see his discovery or invention protected, applies to foreign ships in German seas only as far as the discovery or invention is used in them for the purpose of selling it within the German Empire.

INFRINGEMENTS INTO THE RIGHTS OF PATENTS.

§ 32.

He who infringes the right of a possessor of a patent of his successor in this right, is bound to indemnify them.

The injured party can demand, that instead of an indemnification, a fine may be adjudged to him, amounting to 2,000 thalers.

The fine adjudged does not exclude the enforcing of a further claim to indemnification.

If a party who has infringed the right of a patent, acted bonâ fide and in consequence of an excusable actual error, he has to compensate for the damage done only to the amount of the gain made.

§ 33.

The claim to compensation, fine or on account of a gain cannot be combined with any other claim in the same lawsuit, neither be used as an action against another action or in the way of recrimination.

§ 34.

The court has to decide whether damage has been caused and to what amount, likewise whether gain has been made and to what amount, and the decision is made after a due appreciation of all circumstances and according to independent conviction.

§ 35.

At the demand of the complaint the court can adopt proper measures, to prevent further damage being caused to the complaining possessor of a patent on the part of the accused party; these measures can consist in the threatening with punishments and in the destruction of such things and apparatuses, the possession of which may give cause to apprehend a further violation of the patented right on the part of the accused party.

§ 36.

An action on account of compensation, fine, or gain falls after three years under the right of prescription with regard to every single violation of the patented right, serving as a motive for an action.

§ 37.

If in the process on this action a question has to be brought before the Imperial Upper Court of Commerce, the court, inasmuch such a question has to be settled beforehand, has to prorogue the process and to allow one or the other party a due space of time, within which the question has to be laid before the Imperial Upper Court of Commerce.

§ 38.

In case technical questions are doubtful or questionable, which bear upon the other question, whether the accused party is to be condemned on account of a violation of the right of patents, or on which depends the amount of damage done or gain made, the judge is entitled to consult competent third persons.

FINAL ARTICLE.

§ 39.

The Council of the Confederation is charged with the execution of this law.

APPENDIX P.

REPORT ON PATENT LAWS by DR. ROSENTHALL of COLOGNE.

On 20th May 1872 a resolution carried by a large majority of the Reichstag, referred to the Chancellor of the Empire the petition of the merchant Wappenhans, in Berlin, on the subject of a patent law for the empire; with a prayer to introduce as soon as possible a uniform scheme of legislation on patents of invention, and it is reported in apparently well-informed circles that that resolution has induced the Government to take measures for obtaining an expression of the opinion of the Chambers of Commerce on the subject.

The means here adopted for obtaining the necessary data for a consideration of the question are not new.

Nine years ago already the Government and Chambers of Commerce were invited, by a circular letter from the Prussian Ministry of Trade, to consider the question, whether in the existing stage of industrial progress it was still necessary to encourage the spirit of invention by granting patents.

The majority of the answers advocated abrogation of the system of protection by patent, and thus confirmed the opinion which the form of the question indicated to be that of the ruling authorities.

We doubt whether the result of the most recent inquiry will materially differ from that of the former one. But it will establish a suspicion that the means adopted may not be the best for obtaining a purely and entirely technical and impartial judgment of the matter in question.

If it is the *Prussian* Ministry that has called upon the Prussian Chambers of Commerce for their opinion; we call to mind, in the first place, that in the matter of the projected repeal of the salt duty, a more correct method has been observed. As the "Deutsche Wochenblatt" suggests, it is remarkable that the preliminary measures selected in this case depart in a peculiar way from the system of preliminaries to imperial legislation that is sanctioned by precedent. Hitherto bills for the Reichstag were regularly prepared by the Prussian "Ressorts," or the Chancellery of the Confederation (Bundeskanzleramt) in such a shape that projects reached the Council of the Confederation (Bundesrath) ready prepared, referred by the Council to a Committee of the Confederation (Bundesausschuss) were introduced to the Reichstag often after very hasty consideration and taken charge of by the proper official of the "Ressort" or Chancellery of the Confederation. It is known that this system as hostile to the independent action of the Bundesrath was regarded by the latter and by the Confederate Governments with silent repugnance, which broke forth on the occasion of the debate upon Lasker's civil law motion. In the case before us the initiative is transferred to a commission of experts who frame their proposals from various and not Prussian memorials emanating directly from the provinces of the empire, and will hand them to the Bundesrath to be further dealt with, so that in this way the legislative function of the Bundesrath both formally and substantially remains independent.

To this suspicion which may easily be entertained of the *form* is added a far more important suspicion of the *substance*. The question —whether, after the passing of the law of the North German Confederation, (henceforth by § 2 of the law of 16th April 1871, the German Empire,) dealing with the rights of authors of literary works, &c.,—every intellectual production, so far as it represents property and admits of being protected as property should enjoy protection, we had regarded as settled. We shall find a future opportunity to explain in more details the sense and the scope of our view that it is settled by the first principles of our legislation. It is only the *form* of the petition, already granted in principle by the law, that still requires careful deliberation; the final object of such deliberation is to harmonise the higher interests of the State with those of individual rights.

A discussion by the chambers of commerce can only be directed to this last point and within these narrow limits the judgment of these corporations is valuable indeed, but not by itself decisive, and must be adopted with much precaution. Sufficient proof of this will be found in one word that escaped at the sixth congress of German social economists when the present question was the subject of debate:— "The present Ministry," says one speaker, "has a short time ago "laid the patent question also before the Chambers of Commerce, "and did so with a silent intimation that they were to declare them-"selves opposed to the system of protection by patents. But the "Chambers of Commerce, almost without exception, are not very well "informed on this question, and it is therefore very probable that "they will be decided by the vote of the Congress." For the sake of justice we add that it was an advocate of protection by patent who made this speech; but our object is only to point out the influence that the representatives of utterly unlimited freedom of trade exercise on the Chambers of Commerce, in the judgment of a member of the Congress itself. We do not detract from the great good this congress has done by spreading abroad sound views of social ecomomy, especially as to the mischievous working of protective duties, the advantages of freedom of traffic, the futility of restrictions of interest and by guilds. But we believe that the too unqualified principle of unchecked competition carries the congress too far in the present question. We are afraid the voices of the few manufacturers who belong to the Chambers of Commerce will be drowned in the contagious cry for perfect freedom of trade commerce and production, and abolition of all protective taxes, and "monopolies."

And yet the most recent settlements of principle have proceeded from conferences of experts and members of the Government; the same Prussian Ministry of Trade called men together a year ago from the most incongruous classes in which an opinion on the subject could be expected, to consult them upon separate practical measures for the settlement of the social question; in all the legislative labours of this century great attention has been paid to the resolutions of the Juristentag (diet of jurists); in the preamble to the project of the law upon literary copyright, &c.* it was thought necessary to premise expressly that experts from all classes interested had been heard on the subject, and during the first debate† the Bundes-commissarius (deputy of the Confederation), explained further, " that the project of law had been " framed under the continual active co-operation of authors, men of " letters, journalists, newspaper editors, book sellers, music publishers, " and artists, and the Government of the Bund has had the happiness to " receive from these classes assurances of their complete approval of the " project." If, in the presence of these facts, the Chambers of Commerce are to be heard as representative of the interested classes, then in the language of the representative, Dr. Wehrenpfennig we may " discern the evil powers of the Ministry of Trade lurking behind such " a measure." If it is really desired to hear the opinion of experts, a commission should be formed of eminent manufacturers, engineers, and similar men from circles of social economists and jurists, who have applied themselves to the study of this question with dispassionate calm; in this commission the trading community might then be properly represented also by eminent men. We hope that we need not to encounter the objection that the decision of such an assembly might be disturbed by the interest that a section of its members have in the matter. Setting aside that the proprietors of industrial establishments are erroneously regarded as the parties interested, setting aside that the representatives of the trading community could with propriety be regarded as equally interested in the matter, we hold the firm conviction that the parties convened in the manner proposed, for the preparation of a legislative act which may be decisive of the weal or woe of an entire class of society, and of the development or decay of the industry of our native country would be unselfishly devoted to their important function and to the general good, and with disregard of their separate interests.

The project, also received with pleasure by the Government, which the union of German engineers has handed to the Imperial Chancelery is a proof in itself that the matter has been so thoroughly sifted by the parties most interested that their continued co-operation will at least materially forward the clearing up of the question. Such a commission, formed of members from all countries of the Empire, would remove the suspicion of form mentioned above; it would guarantee a thorough and adequate investigation; it would enable the Government to come before the Reichstag with distinctly stated proposals and sifted matter of fact, as the reporter of the petition committee required in his concluding words; it would considerably lighten the task of the Reichstag, to whom a thoroughly exhaustive discussion is rendered difficult by the short duration of its activity; it would do away with the transfer of the project framed from one committee to another, as happened with the law upon the rights of the inventors, and it would help the Governments of the Confederation once more to the happiness of receiving from the parties interested assurances of approval of their measures. Legislative process may take another course than that proposed, but we are sure of this, since " the protection of intellectual property," as the imperial constitution describes it, has been legally settled, the right of the inventor to the protection of *his* intellectual property will be legally acknowledged also. We are certain of this, because it is the duty of the State to intervene for maintenance of the rights of *all* its citizens;

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* Actenstucke des Reichstags de 1870, No. 7.

† Seven sittings of the Reichstag, 21st February 1870.

because a proposition which simply abolished patent protection would sanction an inequality of rights irreconcileable with the existence of a juridical state; because for the congruity of our laws the protection of all the productions of intellectual labour is necessary; because, in the last place, we assert as matter of principle and sound social economy that the right of authorship has the same claim to respect in the field of technical science as in those of literature and art.

The recorded legislative sanction of the principle of intellectual property, in our opinion, forbids the destruction of the system of protection of inventions. We have no intention of investigating in this place the nature and the justice of the principle of intellectual property; it is on record that in juridical and economical literature it has been dealt with in very many widely different ways, and was amply ventilated in the discussion on the law of literary copyright. On one side we find it accredited with a moral[*] validity, or the legal protection afforded it, is discovered to rest only on a measure of police, justified on grounds of public utility, while others maintain that the doctrine of real property applies to it,[†] or represent it as a personal[‡] right. In reliance on the right of property it was sought to derive intellectual property from a tacit contract between the author and the[§] public, or to discover in it "a third category of rights of property absolute in character, but without substantial basis."[||] Klostermann classes it with real rights,[¶] and the majority of recent authors agree with him in including with it the right of property in the benefit of a mechanical reproduction of the result of intellectual labour. The thing understood and its legal nature are of course not prejudiced by the term, adopted in science and legislation, and everywhere current, of "intellectual property."

In view of the approaching legislative settlement of intellectual property in the sphere of industry, let us take up the position of the preamble of the government to the project of the law upon literary copyright. This project of law, according to the preamble, is to proclaim the legal recognition of "intellectual property." "The question frequently debated in literature of its philosophical basis and its position in positive equity is, of course, not raised in the law; but, on that point, it is left to science to classify the rights of authorship, their scope and meaning being defined, in the general system of real or personal rights." (Endeman, Gstz. betr. das Urheberr. Berlin, 1871, § 1.)

We will only devote a few words to the expression of our dissent from the opinion that a monopoly is involved in the grant of protection to intellectual property, for under this description the greatest abuses are consciously and unconsciously perpetrated. Every friend to sound and real progress must entirely sympathise in the efforts which are directed to the abolition of all those monopolies which restrict the freedom of trade and manufacture, which effects also the majority of the Congress of German Economists, the followers of the so-called

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[*] The representatives of the so-called Manchester School: Friedländer, der einheim. und ausland. Rechtsschutz gegen Nachdruck; Leipzig, 1867: Mohl in d. Krit. Zeitschr. für Rechtswissenschaften. Bd. 25. Kock, Recht der Ford. III. § 341.

[†] Kant, Metaph. Anfangsgründe der Rechtslehre, I. page 127; Fichte, Berliner Mondtsschrift, 1792, page 443; die bei Klosterman, Das geist, eig, &c. Berlin, 1867, und die Patentgesetzgebung, Berlin, 1869, I. page 120 cit.

[‡] Hegel, Grundlinien der Philos. des Rechts, § 68, 69; Gans, System des rom; Zivier, p. 216. Bluntschli, Deutsch. Privatr. 3 Aufl., pag. 478.

[§] Pütter, der Büchernachdruck, &c. § 45. This is also the argument of the memorial of the seniors of the merchants of Berlin (Siemens), Berlin, 1869; v. also Mohl cit.

[||] Mandry, Gesetz vom 28 Juni 1865, zum Schutze, &c. (v. Dollmann Gesetzg. des Königreich Baiern I. V. 2.

[¶] Klostermann, I., page 113 ff; cf. also Homeyer, Jur. Wochenschr. von Hinschius, 1838, page 212; Jolly, die Lehre vom Nachdruck; Renouard Traité des droits d'auteurs, &c. Paris, 1838–9; Oscar Wächter, das Verlagsr. Stuttgart, 1857; Beseler, System des gem. deutschen Privatr., § 228.

Manchester school, practically direct to the destruction of every safeguard of intellectual productions. The superficial resemblance of the author's right, especially in manufactures, to a monopoly, easily explains to us how it has been that this description of it has been tolerated so long; but this toleration is based on an error. If but the shadow of a monopoly were to be found in the protection of inventions we should be the first to demand its abolition. And, seeing that the opinion of a great country is under no man's rule, that both parties are gainers by an exchange of their opinions, and each is a loser by stubborn one-sidedness, we would invite unbiassed reflection, discarding all prejudice, whether the right of the inventor is not wrongly called by this name. There was, indeed, a time in France when patents of invention were granted as tokens of royal favour, and in the repulsive form of trade privileges, to persons altogether unentitled to them; when the Bishop of Orleans had the monopoly of making wax candles, whilst Argand, inventor of the lamp with the double draught of air, had to carry on lawsuits with the guilds of the locksmiths, tinkers, and ironmongers; when a source of income was created by granting patents for known commodities, and inspectors were chosen from the people of the court of wood, butter, and wine. And we find precisely the same thing in England under Elizabeth and James I. But immediately on the abolition of the intolerably exaggerated system of monopolies by the revolution in France, and by Act of Parliament of the year 1623 in England, follows the protection of patents of invention. They stand in diametrical opposition to the purchased monopolies of guilds; monopoly always pertains to one having no individual right to it. The monopolies of the present day in tobacco, salt, drugs, railways, protect the trade in a class of goods, or the pursuit of a branch of industry, for the benefit of a class whose right is derived from the grant of the monopoly itself, to which any other class, in reality, would have been equally entitled; but by the recognition of intellectual property, on the contrary, the right of the individual to the fruits of his own intellectual labour is protected. In support of our assertion that the protection of inventions is not the grant of a monopoly, we appeal to an authority who, in this question, stands, as we do, aloof from all parties, and whose judgment carries great weight with all who are occupied with our public rights. In the second edition of his "Staatsrecht," Ronne* still speaks of the inventor's patents as monopolies, *i.e.*, as exceptionally justified monopolies. He says, verbally, "Exceptions from the principle of the "mischief of monopolies can only be justified, in the interests of in-"dustry, in favour of the so-called patents of invention."

In the third edition, on the contrary, which was published last year, he speaks so clearly that even those who wish it cannot misunderstand him:

"Privileges to which a general restriction of natural liberty, an
"offence to the rights of individuals or the property of other citizens,
"(lex singularis) attach, can only be conferred with the sanction of the
"chambers by the regular process of legislation. To this class belong
"exclusive professional and trading privileges and monopolies; but on
"the other hand not the so-called patent s of inventions, because these
"deprive the other citizens of the state of no natural right that they
"previously enjoyed."

We are dealing, therefore, with no monopoly, but with the right of intellectual property. In the course of the discussion of the recognition of that right in the Reichstag, with the exception of one speaker, who afterwards during the debate declared he had been misunderstood, there was not one voice raised in opposition to that right; but on the contrary it was thought necessary in the general discussion again and again to insist, with evident warmth, on its maintenance. "I believe," declares one speaker, "it is repugnant to us all to throw this protection to the " author as if it were an alms we gave him; we are all agreed in the " feeling that this protection can and should only be drawn from the " ægis of abstract right." A valuable proof for us that the people, by the voice of their elected representatives, express a clear and universal conviction of the equity of the law. This sense of equity gained strength and refinement with the development of civilisation; and is not enduring when it is not identified with a universal code of morality, but its generosity is proportionate to the advance of civilisation; and as the free jus gentium in ancient Rome gained a gradual triumph over the severity of the jus civile, which recognised none but particular contracts of the most binding precision; so does our finer sense of equity now begin to make its way into provinces where a few centuries ago tortures and scaffolds of execution served as recompense.

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* v. Ronne, das Staatsrecht der preussischen Monarchie, Leipzig, 1865. II. 2 § 387, page 280, Ann. 1.

Cf. also Makowiczka's Aufsatz uber Erfindungspatente in deutschen Staatswörterbuch von Bluntschli und Brater. Bd. III. page 422.

But the double question may be raised: why is not the doctrine of right set simply forth, why are details of conditional provisions introduced, which in other cases are foreign to the system of our laws, and how is the limitation in duration of this right to be explained, how can the right be transitory, as it is for authors, and must and will be eventually for inventors? The answer to both questions is one, that in the assertion of an injury, the person of the offender, the manner and extent of the wrong, are not difficult to shew.

Dr. Bähr, the member, sought with his usual acumen to give the solution; he rightly laid down that we know of no transfer without compensation, and advanced his view that, high as the author stands, and well grounded as his claim is, yet he must not be unmindful that he and his intellectual powers are only the fruit of the common intellectual culture of his nation, and that he only, in a certain degree, liquidates a debt when his works return again to the common intellectual culture of the nation. This is an explanation by which we are reconciled to the sacrifice forced upon the owner of the right; but the limitation of the duration of the recognition of intellectual property appears to be still better justified in the light of the following reflection. By the legal axiom in itself little or nothing would have been effected for the benefit of the owner of intellectual property towards bringing his legally acknowledged right into full validity. In the system of law we have hitherto known the application of a right to the circumstances it relates to is facilitated materially.

Moreover, real and contract rights are localised, the former having effect where the subject of them is, and the latter at the domicile of the debtor. Intellectual property is on the contrary so little bound by locality that the range of its validity even extends beyond the national frontiers, and the inquiry whether a right has been infringed is frequently so difficult that the legislature while recognising the justice of literary copyright could not stop short at the declaration of the bare legal axiom, but was compelled to take in hand more extensive provisions of detail to make the legal axiom effective in operation. And just as this consideration, in the above-mentioned case (of literary copyright), led to the preliminary definition of certain phases of author's rights coming under that category, and to the subsequent formation of societies of experts and of the table of damages (eintragsrolle), so will it be found necessary to proceed still further for the protection of discoveries relating to trade; because, in every individual instance, the application and effect of the legal axiom is guaranteed by an act of state authority—the inventor's patent—which puts the state in position of arbiter of every dispute between the real and pretending owners of the right. It is very clear that a settlement by law of the protection of products of intellectual labour has to deal not only with the right in itself, but with the specification also on which it rests; and the erroneous idea is a hundred years old, that the right of intellectual property was a privilege, whereas it was only a privileged specification, that is to say, a specification already anticipated up to a certain point, (even Roenne,*) when the right was not yet generally acknowledged, calls it a privilege (not a monopoly), but he demonstrates the accuracy of our views by defining the subject of the privilege as follows: "It may consist in the recognition of a capacity to undertake "dealings which otherwise would be free to every man as emanations "of natural liberty; of this class are the privileges of crafts and trades "and monopolies.† Or in the assurance of a special protection against "conceivable prejudice and injuries which the common laws either forbid "not at all, or not in this circumstance, or even sanction; of this class "are patents of inventions, copyrights."‡ Now if a universal law conforming to the government preamble mentioned above recognises the right of literary authors and inventors, and secures them this special protection as well, and if process of law is thrown open to them so entitled (for formerly the judgment of an infraction lay with an official of the government), and if also the enforcement of their right by such a special privileged specification is so greatly facilitated to them, then the limitation of the duration of the right has the character of a payment for the intervention of the state, and we are quite ready to maintain the state's right in framing a law of such importance to the commonwealth, to provide for this last in this way. But the importance of this payment for the "privileged specification" must be commensurate with the facility of specification afforded. When patents are granted which admit of a direct specification, a direct payment is justified, the patent dues in addition to the limitation of the duration of the patent.

But is our sense of the matter then really that by which the principle of the question is to be decided, whether the inventor's right in discoveries relating to trade should be placed (as we have placed it in our argument up to this point) on the same footing as that of an author in his literary work, and be recognised and established in the same manner by our legislative authority. The gentleman who spoke on this question in the sixth session of the German economists, the same who also, at the last session of the Reichstag, in the course of the discussion of the petition for the promulgation of a patent law, spoke against the retention of the system of protection of invention, left this question unanswered. But he pointed out the principle on which it was to be answered when he concluded his speech in this manner: "I may be "reminded that the principle which I am laying down, of the untenability of legal protection applies with the same force to the publisher "of books as it does to the patentee. Most certainly it does. If we "were called upon to bring the question of copyright before our economical "forum, we should have to examine whether it is required for the maintenance of literary activity, and thereby for the progress of science; "whether also it is beneficial to the community. It is possible that the

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* v. Roenne, cit. 3 Aufl. 1, § 50, page 215.
† v. Roenne, cit. Ann 1.
‡ v. Roenne, cit. Anm. 2.

"same principle would guide our decision against the grant of a monopoly "for inventions, and in favour of the grant of a monopoly for books."*

Did then the consideration of public advantage come to the surface in the passing of the act of author's copyright? Was the question even discussed by our legislators whether copyright was requisite for the maintenance of literary industry? They were far from holding the intellectual work of our authors so slightly as to think that an opinion could exist that it would stand still or retrograde without legal protection, but "in a discounting age men have learned to measure "intellectual work by its metallic value:" it was noticed that admiration and inspiration do not in these days protect the author from anxiety about his daily bread, that a right of property accrues to him from his intellectual work, and that to the produce of this work the character of a thing belonging to its author, transferable, saleable, recognised by law, must be legally guaranteed, or a whole large class of society would be disturbed in the enjoyment of the fruits of their labour, who in any case were, and would continue, unselfish enough to continue to strive in their works for the prosperity of the nation, even in the absence of this protection to their aim.

We do not in the least maintain that without the protection of inventions intellectual labour would come to a standstill in manufacturing industry. The spirit of inquiry was not lost from the human intellect when it brought danger to the health and life of its followers; it will certainly not be lost now even if no German Reichs law is passed for the protection of inventors.

But we do not intend to enter upon this whole question of the common advantage in this place. If this consideration were made decisive beforehand and exclusively, still (as we wish to propound in this place and prove to demonstration later on) even from this point of view a patent protection in proper form must be regarded not only as not detrimental but as practically advantageous; but in the above mode of propounding the question the danger is incurred of making a party question of one that only has to do with the reconciliation of the titulary interests of the parties concerned to the equitable interest of the state. But the inquiry must not be taken up as a party question whether the principle of legal protection of intellectual property in literary works recognised by the state is to be applied equally to intellectual property in inventions; and if, like the member Prince-Smith, we also decline "to lose ourselves in speculations on legislative views," it is still not sufficient "to stand on practical ground" and entirely ignore the legal claims of the inventor after modern views of law.

The distinction between copyright and inventor's right was brought to a close examination by a "juridical" member of the congress.† But so little evidence is brought out of any difference between them, that we are content to reproduce the reasons, and leave the decision as to their justice in the hands not of a jurist but of every educated man.

The following are the radical distinctions which ostensibly, in a juridical sense, are found to exist between copyright and the right of the inventor:—

(1.) "The person who makes a new invention must stand much "closer in intellectual culture to the inventor than the compositor stands "to the author." How far the distinction between copyright and inventor's right is cleared up by this it is certainly hard to perceive. The meaning of the sentence, however, can only be that he who imitates a new invention must stand closer to the inventor, not he who makes one; without this explanation the above assertion is absurd. It is as if one should say, in other words, because the man who infringes the right happens to be more highly educated, he infringes no right.

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* Faucher, Vierteljahrsschr fur Volkswirthschaft. Jahrgang, 1863, III. B. page 161.
† Prince-Smith. *Ibid.*

(2.) "In case of a reprint a mistake about the work is impossible; " but the question whether the imitation of an invention be an imitation " or an improvement may be very doubtful." It must be inferred from this that an imitation is justified if there is no doubt about it!

(3.) "The publication of a book is no impediment to the pursuit of " further investigation, the effect of a patent is." So that if a patent law is passed the grant of one patent will exhaust the object of legislation. The fourth and last reason seems of the same kind.

Because copyright causes the substance of new investigations to be thrown open to all the world, whilst patenting only conduces to secresy, such a radical distinction exists in juridical character between copyright and the inventor's right, that they cannot possibly be put on the same footing. If therefore a law passed for the protection of the right demands the publication of the granted patent, the juridical character of that right would be suddenly changed.

Schäffle ("the national economical theory of privileged markets") in his attempt to prove that "an artificial delegation of function for " hire and rental is in the great majority of cases unnecessary to the " sufficient use of the discovery for the satisfaction of distributive " justice,*" also puts patent protection in opposition to that of author's copyright, and denies the necessity of the former. But this " wonderful " simple function of distributive justice," about which the same learned man published a series of essays in the "Augsburg Allgemeine Zeitung" of 1867, premises a recognition of the right. Without this the distributive justice has no ground to work upon. Schäffle prophesied nothing good for the author's protection also, at the end of the abovenamed treatise (page 275). " Setting aside the patent theory," he writes, " grave objections are found to exist against the exclusive rights " conferred on vendors by the author's protection, which may perhaps " also be more generally abolished at no very distant future time." This was in 1867; in 1870 the law of author's right was published, to the satisfaction of all authors and artists concerned.

In dealing with the question whether when the theoretically disputed doctrine of intellectual property had been regulated by law, the introduction of the protection of inventions must follow on the principle of equality of right for all, we consider it not immaterial to point out that the works of O. Wachter and Klosterman were indicated, in the government preamble to the project of law relating to author's copyright, as those which had been consulted in framing the proposed project. Wachter begins his exposition in the following sentence:—" Natural " equity contains the postulate that the author of an intellectual pro- " duction, as such, should be so far considered that the fruits of his " labour are secured from spoliation by third parties." At the same time he quotes the expression of Freiherr von Cotta in the Wurtemburg chambers: "The function of the jurisdiction of the state is not ended " by the protection of property, but includes also that of labour and the " reward of labour."

With reference to Klostermann's searching and acute treatment of this subject, in the same work in which he expounds the author's right, we only desire and hope that it may be as carefully consulted in the preliminary discussion of an effective law, as it was for the law relating to the right of authors. Yes, and another eminent author in the field of intellectual property,* in a treatise upon legal protection of copyright, defines invention "as the first, original, truest object of a so-called "intellectual property."

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* I take this involved sentence to mean that inventors would use their useful discoveries, in their own interests, to the full extent necessary for public advantage, without the system of compulsory licences. (Translator.)

The identity of inventors' and authors' rights has been long ago generally recognized in French and English jurisprudence, and that of Germany will adopt the same principle and allot to intellectual property in all its manifestations its place in the legal system, if the legislature strikes on the same plain and right path in the recognition of this intellectual property, that it has kept to in its sanction of the authors' right. But the difficulty of an exhaustive definition of the subject of the patent must not lead to the exclusion of the inventor's right from the limits of intellectual property.

The objections advanced gainst the system of patents by the most prominent representatives of the free-trade school opposed to the protection of inventions (we allude to Prince-Smith, Faucher, Michaelis) may be distributed in two large groups, those which deny the moral right arising from the sense of equity of our modern conditions of civilisation, and the necessity for a protection of rights; these will find matter for inquiry here; and those which deny the public advantage of patents; these last are connected with the inefficacy of the existing form of protection for the most part (as we propose to explain briefly later on), and in so far their consequence (as we shall see) leads us on one hand to a reform of the legislation; but on the other hand, to the maintaining of the protection of inventions as appearing to be absolutely necessary even for the higher interests of the state.

For the doctrine is that the source of the spirit of invention is science, that every inventor as heir of the centuries only applies the intellectual labour of past and contemporary inquirers, that the new production drawn from previous literary labour has no individuality, and it has never been proposed to grant a patent to scientific inquirers for their discoveries.

It may now be asked whether the literary man owes less to the intellectual labour of contemporary and past times than the inventor. In an article directed against the protection of inventions, which for the rest "dishes up the old clothes of vulgar objections freshly ironed out," (*sic*), and whose author is a member of the states deputation of the congress of German economists, a conversation between Goethe and Eckermann is introduced. To Eckermann's remark that it often happens in the literary world that a doubt is cast upon the originality of this man or that, Goethe answers, "That is very ridiculous; we "bring, indeed, our capacity to the task, but our development we owe "to a thousand influences of a great world from which we assimilate "what we can and what is suited to us." Everybody with us will draw from the words "that is very ridiculous" the simple conclusion that it is scarcely an abatement of a man's originality for him to deduce from the scientific achievements of contemporary and past times, the materials for his labour, just as in the same way the production of his own intellectual achievement will remain as a scientific result at the disposal of his successors. But in the passage quoted, an indirect but annihilating criticism of the "groundwork of the patent system," the so-called "property in an idea" is discovered with great glee in Goethe's words. And yet there is no falser conception of the basis of the patent than that of property in an idea. No man in the world proposes to patent ideas. This would be lost labour for the simple reason that justice would have no executive power for the purpose. The demand made by the community for the protection of the productions of intellectual labour only extends to such productions as admit of useful possession as have a direct marketable value. We are not treating of patents for discoveries,* but of a protection for inventions, for the original technical profitable application of discoveries, *i.e.*, of the purely scientific discoveries that we are strictly confining our attention to now. You depart altogether from the province of a patent legislation when you identify the claim of the inventor with that of the discoverer, as they did in the discussion of this question in the sixth congress of economists, and as the members did in the Reichstag. Dr. Brawn, a prominent member of this congress, who also sits in the Reichstag and shares the free-trade ideas of the member Prince-Smith, contended for exactly the same principle with a great expenditure of dexterity and eloquence, in the debate upon protection of literary copyright. If we wanted a proof that there is no property in ideas we should find it in his speech. And what was the result of the advocacy of this principle, when the protection of the author's right was adopted as a principle by the Reichstag, and its adoption justified by the representatives of all parties almost universally, on the ground that his right to an unrestricted enjoyment of the fruit of literary labour was a product of our modern sense of equity? The same member declared that his object had been misunderstood, he had only desired to introduce protection in another still more effectual shape. He said ipsissimis verbis:—

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* Friedlander, cit.

"Is the patent protection not intellectual property? I desire that we " may produce a consistent federal law upon intellectual property and " all that belongs to it. . . . The intellectual authors must be re- " warded; not only their own interests demand it; the interests of the " nation demand it, the interests of the state demand it."

The confusion between a discovery which has no transferable value, (although mediately in its application if may represent a direct object of property), and an invention (which consists entirely in the technical application of scientific discoveries), disturbs in an extraordinary manner the judgment even of men who have addressed themselves predominantly to the justification of the protection of inventions. The assertion that there is no reason for putting the inventor on a different footing to the man of science, to whom he owes everything, is as wrong as it is specious. There is a reason for putting the inventor on a different footing. The labour of the student is not immediately directed to gain, the intellect of the great inquirer is respected and esteemed, and this esteem secures him a position in life; he has an interest in the widest possible dissemination of the result of his researches; personal recognition is his first reward; this is followed, as a rule, by the further reward secured to him by the law for the protection of the author's right which nobody can deprive him of; finally, by the fitting employment that our modern institutions provide for him in public establishments or some other way. To all this we must add that his researches as mere intellectual labour demand no employment of capital. The work of the inventor on the contrary is intended for profit. His reward is in the product of his industry and its profitable employment. Every imitation completely replaces his work, the law of author's right does not protect him; finally he is compelled to employ capital for the attainment of his object, and the assumed advantage of priority on which Schaeffle places such stress is a farce by the time the priority begins to pay. The remunerative use of an invention is according to the same author secured without any monopoly, partly by giving the artificers he employs high pay and a share of his profits, partly by dealing with a circle of clients already acquired, partly by taking advantage of the credit that attaches to well-skilled mechanics. To deny the necessity of patent protection, which we no longer designate monopoly protection, on such grounds is like throwing a fish in the water to drown it. The "high pay," the "share of his profits," the "use of credit," do not plead against, but in favour of, the protection of inventions. The dealing with a given circle of clients and the principle of unlimited competition are irreconcileable ideas to us, unless the possibility of maintaining secresy is believed, or, as is the case with Krupp, the "existence of "sufficient capital," supposes that the needy inventor must in the first place seek out this, which he can most readily find in a free patent protection. We are surprised with the question, why should the state assist individuals to apply to their sole profit, and at the cost of the community, the discoveries which great men offer liberally as a free gift to the whole community? And the right way of stating the question is intentionally or accidentally avoided; should the state assist individuals to make the discoveries (which certainly belong to the whole community, to the inventor and to the patentee no more than to others) to make these discoveries, then for the first time practically valuable, to raise them out of the province of mere observation and knowledge into that of commercial life, and thus for the first time to make them a benefit for the community? The discovery of the motive power of steam, of the illuminating property of hydrogen gas, of the electricity of contact, of the influence of the electrical current on the magnet, of spectral analysis, they are all of the highest importance to science, and the value of the idea belongs to its discoverer; but its application to manufacturers, to material production, is the object of quite a different kind of industry which has nothing to do with that of the scientific inquirer. Its task is to seek out where an elaboration of those discoveries is required, and by immediate practical application of this idea to satisfy the wants of commercial traffic. The accomplishment of this task, however, produces no new idea, but it produces a new subject of property, a new article of commerce, and it is wished to refuse to this thing the protection of the law, because it is easy for a student to depreciate the difficulty of the task, forgetting that in the scientific discovery of a chemical process or a law of physics, the problem for its industrial application is only then laid down, and in most cases the solution of this problem demands not only technical talents and knowledge, a rational system of research, and often long years of experiment, but most generally an expenditure of money also an introduction of capital to the task.

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* Therefore not of "making a thought the subject of a right," as Hack seems to take it in the Zeitschrift fur die gesammte Staatswissenchaft, 23 Jahrgang 1867 page 89.

The intellect of man is liberal; discoveries will never be wanting; but if they are to be usefully applied to industrial objects, the technical man must begin his practical studies with the fact of the discovery and get the assistance of the less liberal capitalist for their prosecution and completion. But, in rejecting the title of the inventor, his independent activity is so far disputed that not only Michaelis at the Congress, but Prince-Smith also in the Reichstag, described the patent as a kind of lottery. But the danger of drawing such comparisons of prejudice (which take by surprise at first sight by their similarity, but only shew in the end that in drawing them you depart from practical ground and forget the mode of investigation proper to your subject), is shewn by the deductions which the same speaker makes two minutes afterwards. We take his own words from the shorthand writer's notes: "For the "practical production of an invention are necessary, first, the sym-"pathetic idea, the happy conceit; secondly, physical and technical "knowledge; thirdly, technical cleverness; fourthly, capital; and fifthly, "mercantile capacity to make it profitable." Prince-Smith did not expect by this explanation to establish the likeness between obtaining a patent and winning a lottery, but only to point out the danger of concealment; but, we would ask, if so many things are necessary to the production of an invention, theoretical and practical talent, capital and mercantile capacity, if these are the conditions for attaining a patent, is it right for you to talk of a fortunate chance in a lottery when an invention fit to be patented is in fact patented? Is it not distinctly a "contradictio in adjecto" to say that talents, labour, and capital are necessary to an invention, and in the same breath to describe an invention as a result of chance, as a lottery prize? Besides the unapt comparison is also illogical. Is a patent, in prospective, a prize for which a man, as Michaelis himself says, sets his property, health, and strength in the scale? In our view the patent is the simple recognition of a right of the inventor to the fruits of his toil; it is the means of winning a prize; the consuming public decide the value of this right. Nothing is won by the empty patent; with a just system of patent legislation, in some cases only the expenses are lost by it.

From all this we do not regard it, in any sense, as a disapproval but only as a confirmation of our principle, attributing to the inventor a right to protection, if the strongest opponents of this protection desire to have another kind of reward substituted for patents. Prince-Smith declared that the immediate object of a patent is to reward the inventor; and that the encouragement of inventions is of such great importance to the industry and prosperity of the people, that we have a sufficient motive for devoting adequate sacrifices to that purpose. He only wants a more practically effective mode. Michaelis suggested a compensation from voluntary gifts. Braun wants a still more extensive form of compensation than that of patents, and seeks it in a kind of tantiéme (per-centage). Faucher finally closes his speech attacking the patent protection in these words: "When we shall have become capable of "rewarding the inventor of the mule, or any other great technical "discovery, as the Italians rewarded their Leonardo da Vinci, then will "our social system be no longer based upon mere individual selfishness; "no! then we shall stand on the religious, the broad basis of public "morality, and to advance this condition (of the state) is the real duty "of each individual."

In place of the last unexpected and wide-reaching afterthought it would have sufficed to say, then we shall no more want patent protection, which has lately, in its hitherto known form, brought much inconvenience along with it.

These views of the opponents of a protection for inventions coincide with our proposition in the point that the inventor must be in some way rewarded, indemnified, as we choose to call it, legally protected. The view of the Prussian government (which the chancellor of the former North German Bund stated in form in his proposition addressed to the Bundesrath on the 10th December 1868) to the effect that measures should be taken for the complete abolition of the patent system in the domain of the authority of the Bund, without replacing it by any other form of indemnification (we may call it so for once), will therefore not be adopted for a moment by the leaders of the anti-patent agitation.

But the idea of a national reward for the inventor must be rejected à priori, for it cannot but imply the recognition of the inventor's right; it is further to be rejected because "dead letters do not make a law." For, if we reflect that Napoleon regarded the steamboat as a fool's illusion; Humboldt, telegraphy as a chamber experiment; Dominic François Arago, railways as a fruitless and expensive means of traffic, whilst the optical telegraph was considered a great invention; then we see in such a form of reward rather an act of injustice than of justice; then we give warning against a procedure in which the most unprejudiced scientific commission must fall into errors and misconceptions.[*]

It is the duty of the state to promote discoveries, the scientific bases for inventions. It must endeavour to accomplish this by erecting educational establishments, and by endowing them with rich resources and capable teachers. The application of the discovery, the profitable use of inventions, falls under the province of trade and traffic. The protection of the invention is but a protection of the possession of an object of trade, of a marketable commodity, and if its owner only demands a limited term of protection, to make common property after a comparatively short time of his own private property, this just demand must be complied with, after the law has recognised his right, without hesitation.

The tantième, a premium for every application of the invention, would be, after all, the most theoretically just indemnification. But it does not admit of practical control, and we need not complain too much of the impracticability of this form of compensation, because a liberal reform of our patent legislation offers in its consequence a substitute with which the inventor may be content, and under which our nation will assume its place among the creative nations of the manufacturing world.

If it is true that the protection of inventions only guarantees the inventor the recognition of his fair right, but not the enjoyment of a monopoly, this is a refutation of the objection that patents clash with the principle of free trade. It is only the unlucky conception of a patent as a monopoly that has made the patent system seem to be incompatible with free trade. The inconsistencies and disadvantages of the application of our unsatisfactory patent legislation were simply laid at the door of the patents as monopolies. And yet free trade is just the essential preliminary condition for a system of protection of inventions on a free basis. Free trade represents nothing else but an appeal to individual enterprise; with it the legislator stands on the ideal ground of the freest justice; with it he sets a seal on the first principle of the "state idea," aiming at this, that every man in the land have free disposal of that which he has won without detriment to others. But it is a delusion to suppose that the inventor by his exclusive right of utilising his invention contracts the natural freedom of production and traffic. It is a kind of πότερον πρότερον (which comes first?) The unnatural thing is that a third party should use at his pleasure for his own profit the exclusive production of my own original intellectual work. The good of the community is cared for to the very utmost if the inventor gives up his established rights after a certain time; but, at first, this established right of the inventor exists, not that of the rest of the public. He makes no attack on other men's rights, but others on his, if the legislator refuses to protect him. It is not the temporary limitation of production, but the infraction of the natural sphere of certain persons' rights, that is an outrage. Free trade and the protection of inventions stand in precisely the same relation as freedom of the press and copyright. Each in a manner seems to exclude the other, but both result from a free and well-ordered system of government. But now in support of the accuracy of our view we appeal to the trade regulation (Gewerbe-ordnung) itself. The preambles to §§ 7 and 8 say distinctly that the privileges derived from the ownership of patents are in no respect similar in their contents to the exclusive trading privileges, because they do not immediately convey the right to the exclusive pursuit of any trade.

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[*] We refer here to some articles which appeared in 1869 in the "Volks-Zeitung." This paper, although its tendency is certainly not towards the support of burdensome monopolies, speaks in the most decided manner in favour of the conservation of patent protection.

But we have to revert once again to the phenomenon already mentioned several times, that an axiom which appears to be true at first sight is, closely considered, a false conclusion. Not only are patents no check on the enjoyment of the community, but it is they which first render an invention practically available, and its application possible. When an owner is confirmed in possession of real property the value of the property is vested in him; in the recognition of intellectual property the right of making it valuable is conferred. Have not our German inventions, telegraphy, telegraphic printing, cement, steel manufacture, aniline colours, been taken to foreign countries in search of the capital necessary for their development? Every German capitalist is afraid to lay out the preliminary amounts required for experiments, construction, models, &c., if he is not sure of his property afterwards. We have represented above that the spirit of invention will not expire with the abolition of the protection of invention; but the prospect that the exclusive use of invention is lost with its publication, and the ready resource of concealment, will as certainly impede our industrial progress, as the want of a railway monopoly deferred for many long years, our enjoyment of the railway. We spoke of industrial progress, we readily believe the assertion of the opponents of protection that our industry will not stand still; but the object of protection is not to enrich our manufacturers but to protect the inventor. And if it happens that a manufacturer in addition to his establishment and his resources possesses also the intellectual capacity for making new inventions, his claim to the protection of the fruit of his intellectual labour is as well founded as the claim of a wealthy author or artist to protection of his copyright. The common interest of the inventor and of society demands that security, even if limited, be given to the right in an invention. It is a grievous error to suppose that no more impulse is required to satisfy the demand for inventions. If the inventor is robbed of the power of securing the reward of his labour by dealing with his right on the basis of its legal guarantee to him, then the melancholy phenomenon will become more frequent, which hitherto came to light under our faulty system of patent law. The benefits of free competition will be confined to the cheapest and worst imitations; the enterprising technical man will be driven to turn his back on his country, taking his invention with him if he wishes to make it profitable, and our German industry will lag still further behind that of England and America than it unhappily lags already. It is an error to assume that in the present condition of industry inventions will keep pace with the demand, that the free co-operation of all will far sooner satisfy this demand. A retrospect on the inventions of the past year shews that we owe to the protracted studies and experiments of individuals the astonishing achievements of our technical industry,* and that precisely those nations which grant the greatest number of patents produce that which is new and creative. Our industry mostly follows after others; all modern inventions worth naming, partly German in their origin, were brought to us first from abroad to come into application after they had been used there for a number of years.

It is unworthy and foolish to use the pretended prosperity of industry as a cloak for our own poverty of intellect and our sluggish home production. In spite of loud complaints in England and America of their imperfect patent legislation, these countries are far from intending to bury the prosperity of their industry by abolishing the protection of patents. In England a Commission assembled for this purpose has declared its opinion in favour of the perpetuation of the protection of inventions; and significant is the answer of a member of the government to a question of the President of the Commission on the subject: "From "considerations of expediency I hold it to be advisable that our country "continue the system of patents, even if the whole world else abolish it; "in that case we should always find ourselves at the head of industry in "comparison with the people of every other country." This answer comes in confirmation of the opinion of another Englishman, published 30 years ago: "The fear of invading public right has prevented the "redress of private wrong, under the delusion, which I trust will not "much longer prevail, that the public has a greater interest in a quick "reversion of second-hand patterns, than in a quick succession of new "designs, the natural result of that active and honourable competition "which protection alone can produce." (James Thomson. A Letter to Sir Robert Peel. London, 1840.)

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* Cf. Rau, Grundsätze der Volkswirthschaftspolitik, Heidelberg, 1854, S. 230 a Anm. c, who in no degree shares Schaeffle's views.

America has recently entered upon negotiations with Austria to arrange for a mutual protection of intellectual property in the domain of industry. Switzerland is not to be mentioned; only in such a small country, surrounded moreover by countries in which protection is afforded to inventions, can industry be maintained without it. The committee of the Bundesrath formed for the consideration of the patent question had the honesty to acknowledge this. The industry of Switzerland can imitate without impediment and bring its own inventions to a foreign market. It is situated, as Klostermann says, like the man who required no cats because his neighbours kept a number. Nevertheless, at one time influential voices were raised, both in the national and the states councils in favour of the introduction of protection to inventions for the relief of the languishing industry of the country. The revised federal constitution of 1865, which in the plebiscite was rejected by 175,000 against 135,000 votes, contained a resolution to that effect. Whilst a patent legislation which adopted the proved arrangements of foreign countries, and perfected them by new conditions adapted to the times, would enable our engineers and technical men to rule the markets of the world as foreign countries now do, a one-sided measure for the abolition of patent protection would certainly give the deathblow to the fresh and lively genius for peculiar original creative productions, even if the "bandits behind the tall chimneys" should find their account therein. We do not so much dread the concealment of inventions as the impoverishment of intellectual creative power, the want of the lively impulse towards new inventions which the legal protection alone supplies, and which we perceive, for example, in the application of the sewing machine, the invention of which was followed by a whole series of other inventions which all bear foreign names (as Howe's, Wheeler and Wilson, Singer, Grover and Baker, &c.). But Prince-Smith takes precisely this instance to forge a weapon out of it againt the legal protection of inventions. He perceives a great wrong to existing industry in patents, because any man may produce a small but important improvement on an existing machine, patent it, and thereby compel the previous manufacturer to close his establishment. But, Herr Prince Smith! the previous makers have really no need to close their establishments. There shall really be no such a clause in the patent law of the empire as should forbid a manufacturer to proceed with his machines because another man is working with an improved machine. Three courses, to speak very precisely, are open to him. Let him work on in his previous fashion, or let him obtain, if it pays him, an improved machine, or finally if he thinks the improvement is not new, our reformed patent legislation must enable him to dispute the independent or supplementary patent, and to bring his complaint by proper process of law before the proper judge. If the judge is deficient in technical qualification for deciding the case in point, then according to the ordinary rule of procedure, it is the right and duty of both parties to produce experts; they eventually agree to one umpire, and neither party will be entitled to complain of the judgment thus arrived at.

All fears connected with the recognition of patents for improvements, as for instance that the protection will give rise to hundreds of vexatious lawsuits, are addressed to the form of the protection hitherto known, not against its propriety. The legislature only offers protection to such improvements as constitute independent new inventions; the decision on this point it leaves to the judge, who finally demands the proof of it from the parties concerned, The judge, or the appointed skilled experts (not a government official who has to decide all sorts of questions), must ascertain whether they have before them merely a change of form and dimension, or simply variation in the mode of applying known parts, or an original new invention, which can always be scientifically explained afterwards. It is never possible to avoid altogether the occurrence of roguery in proceedings at law, but it will certainly be diminished when the accumulation of worthless patents is prevented, the sense of security strengthened by a judicial decision, and the decision and annoyance of government officials is done away with. We will revert in a few words to the practical measures necessary for this.

But, during the time that the use of his invention is the exclusive property of the inventor, the application of it for the public benefit will not be impeded to the extent often asserted by the opponents of the patent protection.

The possession of a patent only acquires value by the sale of the patented goods. The personal interest of the owner induces him to bring his manufactures to the market before his private property becomes the property of the public. It is only in theory that he is able to raise the price of the article at his pleasure. The demand will not keep pace with the supply unless these are brought into proper relation by the price. Practically the active industry of the inventor himself, his desire to find for the production of his intellectual and material efforts as wide a market as possible, have brought most of the modern practical inventions into general use, and secured to the inventor the enjoyment of the fruits of his labour.

We not only admit, we ourselves expressly state, that often, in spite of the possession of a patent, there has been no profit, and the expenses of years of experiment have been wasted. But, if you attempt by that to prove more from this than that the possession of a patent is no guarantee for the profitable character of the thing patented then you are going too far. It is wrong and inapplicable to the circumstances to lay down, in exaggeration, the general axiom that inventions produce insane excitement. There are inventive fools, every condition of life contains men who are always pondering over the men whose exertions have been crowned with extraordinary and famous success. This phenomenon will never disappear. Commerce has its projectors; art in every branch has its crazy idealists; among government officials there are men enough before whose eyes some appointment is for ever hovering, on which they often think without neglecting their duties, and only in ripened manhood, when the nearer anxieties for family and position keep them occupied, they turn back from their over-ambitious idea. What per-centage of all scientifically or belle-lettristically educated minds have dwelt upon the idea of writing one book at least, even if it be a very little one? The greater part of them live on none the less peacefully in their vocations without bringing the idea further than a project; another part get as far as the beginning of a chapter, and are cured for a time; only very few compile anything readable, and yet these are protected by the law of copyright.

When it is no longer possible to cause fear and anxiety by patent lawsuits, to abuse patents as a means of extortion, when, as in other disputes at law, the contentious lose the costs at law, and those of the patent besides, then enough will have been done to prevent an inundation of patents. That there are people in the world who are given up to chimerical plans is a fact which is neither a misfortune, nor to be averted by the absence of a patent law. Moreover, consideration for them disappears in face of consideration for the great political and economical duties which the legislator must keep in view in the question under consideration.

That the patent laws hitherto published contain great disadvantages is well known; that in the face of this and of the difficulty of their amendment the wish has been expressed for abolition of all protection is conceivable.

Along with quite different systems, with that of free registration (France, Act of 7th January and 25th May 1791, and of 5th July 1844; the Latin States, Italy, Spain, Portugal, the Netherlands, Belgium, Austria, Act of 4th July 1836, 3d March 1837, 8th July 1870, and 3d March 1871; Russia, patent law of 22nd November 1833), and of general summons (England, Act of Parliament, 1623, Act of 1st July 1852, Report of the Committee of 29th July 1864), the most manifold principles are laid down in different countries, about publication or concealment, the duty-free grant, or the levy of annual dues, about the conditions of novelty and utility, about the shorter or longer duration of the patent. In Germany especially the state of the patent system is absolutely scrofulous, to such an extent that not only do the most different patent laws prevail in the separate states, but in Mecklenburg and the Hanseatic towns no patents at all are awarded.

Among the preliminaries to legislation that have been taken in this country we mention here:—The agreement by the States of the Zollverein of 21st September 1842, which has been provisionally cancelled by the treaty of renewal of the Zollverein of 8th July 1867; the proposals of the committee ad hoc of the German Confederation of 1852 and 1863, and the proposal of a German patent law drawn out at the instance of the Prussian government; for Prussia, the "publikandum" of 14th October 1815 (circular-verfugung vom 17 Dezember 1831, § 9 der Allgemeinen Gewerbeordnung vom 17 Januar 1845); for Bavaria, (besides the French patent law of 7th January 1791 in force in Rhenish Bavaria), the law of 11th September 1825, relating to the commercial principles for the trading community (law of 30th January 1868, Art. 34), and the regulation of 10th February 1842 (conditional system of registration); for the kingdom of Saxony, the regulation of 20th January 1853, relating to the granting of privileges (system of registration and investigation); for Wurtemberg, the revised Universal Trade Regulation of 5th August 1836, Art. 141–164 (Art. 67 of the New Trade Regulation of 12th February 1862), and the law relating to patents of invention and introduction of 29th June 1842 (like Bavaria); for Baden, the rescript of the home ministry of 23rd May 1845 (system of preliminary investigation); for the Grand Duchy of Hesse the articles of the constitution, Art. 104, and the regulation of 17th November 1858 (system of preliminary investigation); finally the "project of a patent law for the "German Empire," delivered to the Bundesrath last year by the Society of German Engineers.

The value of this last must not be under-estimated. It arises not only from a comprehensive mastery of the subject, but considers also in an exhaustive manner the home and foreign legislation bearing on the question. In its present shape it disposes of a long series of complaints made, with no injustice, against the now prevailing system; it attempts successfully to reconcile the interest of the inventor with that of the community, and even if the consideration and discussion of an imperial patent law may probably lead to some improvements, it at least teaches us to conviction, that the demand for a protection of inventions need not be rejected because it cannot be accomplished, that the uncomfortable and unpleasant is not so hard and impossible as it is represented. Finally, by the circumstance that the arrangements in force in other great industrial states appear there collected into one whole, the prospect of an international effectual regulation of the patent system, which must form a necessary complement to treaties of commerce, is brought materially nearer.

The complaint is not unjustly brought against the pure registration system that it opens the door to trickery and fraud, and is the occasion of a multitude of vexatious threatening to especially the rightful inventor. In the same way the pure process by preliminary investigation admits a well-grounded fear that a just and adequate judgment is impossible from a committee, however carefully formed, and also that apart from influence and favouritism, insignificant or pretended inventions may be accepted, and really new and useful ones on the other hand rejected, and by this the officials are charged with a responsibility which they can never be competent to discharge.

The project in question removes these suspicions, by appointing a consultative preliminary examination by a special authority, "the patent office," which in the interest of the public as well as in that of the petitioner is empowered to dissuade, but only to dissuade, the prosecution of an improper application; if the applicant insists on the grant of the patent, his application is published, with a record of the dissuasion. Everybody is entitled to make good his objections to the grant at the office, and the inventor, the patent office itself; finally, any third party is empowered to dispute the decision of the government officials by proceedings at law; the inventor, if he considers himself injured by the refusal of the patent, the patent office if the interests of the public demand the cancelment of a patent improperly granted, any third party if the grant of the patent appears to damage his own proper rights. The judgment of questions of this sort relating to the granting, the invalidity, or the cancelment of patents, as well as of disputes between the holders of different patents as to the compass of their respective rights, is allotted by the project of the same law court (Reichs-Oberhandels gericht) which has also to decide, in final appeal, all other disputes of the same nature.

The court is permitted to summon skilled witnesses for its perfect information on all points, and there is no doubt that their decisions will in a comparatively short time form a sufficient body of precedent as will hold out to the fraudulent litigant no hope of success, and discover the boundaries between that which must be permitted for the interests of the community, and that which is sheer imitation and dishonourable appropriation of other men's rights. But especially the danger will be removed which has been enormously exaggerated, and is especially cried out against by the laity, that the merit of an invention belongs to many, but only one reaps the reward. On the one hand, this accident is not so frequent as it is asserted to be; on the other hand, the patent will be pronounced invalid in favour of a third party, if it appears from any cause to be unjust towards him.

The project includes the obligation of publication of the invention, of carrying it into effect within a stated time, of payment of patent dues, and fixes the duration of a patent at 15 years.

The obligation of publication and of carrying into effect is not only a protection against the concealment of worthless inventions, and the much dreaded accumulation of unfounded patents, but a means for the introduction of the inventions, for furthering production, and stimulating to new inventions.

The principle of patent duties on an advancing scale, already advocated by us, is directed to the removal of the first-mentioned evil. It is, from its comparatively limited extent, no hardship to the needy inventor, and the less that the prospect of legal protection of his invention not only facilitates the procuring of the small amount, but insures it to him.

The duration of a patent must, as the preamble of the project rightly observes, be the same in all cases. In accordance with the principles of the whole of the law it must not be left to the discretion of the patent office; it must be so long that a sufficient enjoyment be possible, and the protection do not expire before the invention is fairly introduced. But the limitation of the production for 15 years will, under the operation of such a law, certainly not be a grievance that can be brought forward as a plea for the abolition of the rightful recognition of the inventor's rights. Even during this time, as we have already shown, the interest of the inventor will urge him to the widest possible distribution, and this alone naturally excludes excess of price.

The project of law, of which we have set forth the principles, will doubtless undergo many changes for the better, in its provisions of detail, in the hands of the functionaries called upon to examine it; it will, for example, have to take account of the right of the present holders of patents. But everybody will agree with us that the principles of the project explained above are well adapted to promote the removal of objections by unprejudiced discussion, and that in the perfection of their provisions they certainly offer the guarantees which the community and the inventor are entitled to demand for the maintenance of their respective rights; and they will, we hope, be at least acknowledged as the point of departure for a liberal process of patent legislation.

Intellectual property in literary works, which, on the first discussion of the law on the subject, was also decried as a "monopoly," has, by the legislative settlement, recovered its honourable name as a well-founded right, and that so completely that in addition to the indemnity at civil law a punishment is provided for the offender in the criminal law. We are assured that intellectual property in the no less important province of industry will have its right placed on record, and an international protection for inventions will be pioneered by the legislature of our German Fatherland. The men to whom we owe the repeal of the usury laws, free trade, literary copyright, &c., will not molest the inventor in his fair right, but secure him the liberty of his intellectual property, and enable the powers of industry to be profitably developed in this struggle of unlimited freedom.

From the bottom of our heart, in the name of a class of society to which we are only bound by the thought of the welfare and prosperity of our nation, we adopt the words of Uhland, and address them to the representatives of the people:—

"Let the good faith you have shown us
Be commended with our thanks,
And your further work of culture
Be with confidence awaited."

(*Translated by J. W. Mollett, B.A.*)

APPENDIX Q.

THE PROTECTION OF INVENTIONS A RIGHT IN THE INTERESTS OF SOCIETY.

L'Avenir est à l'Invention.

Prize Essay of the District Union of German Engineers at Cologne. (Kölner Bezirks-Verein Deutscher Ingenieure.)

An indispensable preliminary to an investigation of the question of the introduction, or continuance, or abolition of protection of inventions, is to establish precisely what it is we mean by an "invention," what claims it has to the protection of the law, and what advantages it confers on the public, and to sift contradictory opinions.

The astonishing progress in all fields of exact science has had such influence on manufactures that the latter can no longer be conceived apart from the aid they get from the former. Colours, photography, telegraphy, mining, working in wood and metal; in a word, all productive industries appear as zealous and docile pupils of the exact sciences, and owe chiefly to them the high state of their development. The value of the exact sciences is so universally recognised that we must seek in this circumstance alone for an explanation of the eagerness for scientific education which never wearies of demanding the erection of schools, libraries, and societies for the propagation of knowledge. That eagerness has been the reason why almost every new discovery of the learned has been immediately followed by an invention by the technical man, and this relation between discovery and invention has decided many to regard invention as an implied or necessary consequence of discovery. In order to examine the correctness of this view we must investigate more closely the meaning and the objects of discovery and invention.

The idea of a discovery premises the finding out something that was not known before, therefore an increase to knowledge. Men discover planets, territories, animals, plants, minerals, the relations of substances, laws of certain phenomena, mathematical theorems. A discovery may be unintentional, accidental; all that is required in this case is for the discoverer to have scientific instruction and power of observation enough to note the discovery. Opposed to accidental discovery is rational research, which by calculation of certain conditions must lead to a determined end. If the inquirer's labours within the given limits are reliable they have an intrinsic value for science, whether the discovery made be positive or negative. But whether the discovery be the result of rational research or of accident, it is in every case an increase to our knowledge; an apprehension of that which before was unknown, or, at the most, only matter of conjecture. The work of the discoverer, therefore, does not consist in the creation of the thing to be discovered, but in the creation or combination of the means by which the discovery is achieved; but after the discovery has been made its only value is the new fact of knowledge (*judicium*) it becomes; the means of the discovery are then of very subordinate consequence.

Hence the definition of the word itself may be explained; a discovery consists in the opening of an object already present, but hitherto veiled, *i.e.*, not known, not perceived.

Invention, on the other hand, always consists in the production of an object which was not present, but so far known that it was had in view (or "the object of intention"). To invent is the same thing as to think out, to produce, and hence it follows that an invention can never be made by accident. The activity of the inventor in the field of industry is twofold: he has first to fashion the idea of the object to be invented, and then give his idea real existence.

In laying down principles for the protection of inventions these operations must be kept carefully distinct.

Each activity is supported by the causative connexion of certain parts of knowledge which, in common with every judgment, are the results of scientific research, that is to say, are discoveries. This is the much-exaggerated sole connexion between invention and discovery, a connexion in which most discoveries stand to all previous discoveries.

The distinction between invention and discovery will now be made clearer by a few examples.

After the illuminating properties of hydrogen in certain combinations with carbon had been discovered, the invention corresponding to this discovery consisted in the idea of gas-lighting with hydrocarbon, and in the production of the means for carrying the idea into practice. The first part of this invention, the idea of gaslights, is a direct consequence of the discovery of the illuminating gas, and only premises, besides knowledge of that discovery, knowledge of the want of lights. The same applies without exception to all inventions; the idea of the application of tar colours was suggested by the discovery of them. Every invention, as an object of apprehension, directed to the idea on which it is based, premises in the first place only the knowledge of the discoveries connected with it, and the knowledge of the want. When this seems otherwise it is because the observer was not, or is not, familiar with such knowledge. The layman, and many a manufacturer, has not the knowledge of the aërodynamic paradox, and cannot, on that account, perceive in the injector a closely connected application of that principle. The student of physics, on the other hand, has no concern with the wants of the owners of steam boilers, and to him, on that account, the injector appears to be the elaboration of a completely new idea.

Let us now consider the second part of the inventive process, the elaboration of the idea; and we remark that precisely in this is the principal function of the inventor, and the sole value of invention to manufacture. The value of the idea is the discoverer's property; its applicability, the value of the idea for industrial objects, is entirely determined by the invention made out of it. The discovery may be of the greatest scientific importance, whilst its result as an invention is of no consequence at all, if the proper means for its elaboration are wanting, or if there is no existing want of the invention. The discovery that the diamond is combustible was of great moment, because it explained the nature of the precious stone at once; but the production of heat or light from diamonds is worthless, until they can be cheaply supplied, apart from the superiority of other sources of heat and light. If this example is considered frivolous it is easy to find others. Suppose it was desired to build a self-acting playing pianoforte; the barrel organ, the musical snuff-box, the Jacquard mechanism, supply directly the general idea for solving that problem; but much labour and ingenuity would be required to construct an automatous performing pianoforte which could find acceptance as a thing that was wanted.

If we return to our first example of the gaslights, we learn from the history of this branch of manufacture that in the realisation of the idea an uncommonly complicated apparatus, and a very great number of separate inventions of the most widely different description, were made necessary; and it was only by the aggregate of all these inventions made in the course of half a century that the present perfection of gaslights was attained. There had to be provided for, the manufacture, purifying, and storing of the gas, regulation of the pressure, conduits, meters, and, finally, the arrangements directly applied in burning and illuminating; altogether we see, for a series and combination of operations and arrangements, descriptions and illustrations of which are enough to fill a very thick volume.

The fundamental idea was, no doubt, supplied from the discovery of a learned man, but nothing more. Some people, it is true, maintain that the production of gas is based on the discovery of decompositions or combinations, the purification on that of certain chemical processes of reaction in different bodies, and that all the mechanical arrangements are only combinations and variations in form and dimension of parts known long ago. This assertion may suffice for a posterior scientific explanation of the invention; but if it is advanced in depreciation of the inventive process before the work of the discoverer, it proves nothing but the thoughtlessness and ignorance of the judgers. The invention, the application, must, as we remarked before, necessarily be preceded by the discovery, *i.e.*, the judgment; every form is capable of a geometrical definition, the combination of bodies must be in accordance with chemical or mechanical laws, the knowledge of which is naturally requisite to bring about the combination; and changes of dimension are often subject to conditions the satisfaction of which is only arrived at by long years of hard work.

The opponents of the protection of invention who raise that objection to depreciate the value of the inventive process, go so far as to pretend that every invention springs so spontaneously from the actual aggregation of knowledge possessed by the public that every want can be immediately supplied, and where this does not happen that it is scientific research, discovery, which has not reached so far. The absurdity of this assertion may be learned from all the inventions in applied mechanics, which are almost without exception based on discoveries possessed by antiquity. This is so true that the historian of civilisation is perpetually inquiring, why in antiquity and the middle ages the discoveries of the said art were so far behindhand. But the experience is every day repeated that the inventor has the greatest difficulties to surmount in precisely this province. Mechanical inventions are still far from their conclusion, and those who discover in every new machine only changes in dimension and form of known parts, would earn for themselves an incalculable reward if they would solve the open questions of machinery building. Surely they ought to know that the combination and change of form and dimension of known parts demands, besides the knowledge (not so easily acquired) of those parts, an often extraordinary critical and synthetical capacity, but especially a lively imagination;—that the right appreciation of the want, the selection of material, the calculation of mercantile traffic, are often the greatest difficulties.

If, as is to be hoped, a connexion is established by land from Dover to Calais, it will be by a tunnel or a bridge, both well-known things which finally will be built by well-known means. The choice of the means, however, will require some consideration and many experiments, the connexion of the parts will not be easy, and the furnishing of the smaller and least of the tools and appliances will necessitate many an invention, but the material of the separate parts will not be new, and the new will not be so material that it could not be replaced in another way.

According to the views of these opponents of protection of invention a patent ought not to be granted, because everybody is in a position to make the invention for himself if he comes in the case to want it, *i.e.*, inventing is so easy that every man who is equipped with the necessary knowledge can and will make every invention admitted by the state of science when he wants it. Incredible as this assertion sounds it has been advanced, and is daily repeated in certain circles. Nobody has proved it yet. But it is almost impossible to convince those who bring it forward of its inaccuracy, because, in the rule, they know nothing of mechanics, and yet think themselves qualified to pronounce upon the nature of mechanics on the ground of general technological knowledge.

But this assertion is one of the heaviest motives in the line of argument directed against the protection of invention; and the movement in favour of protection will therefore have precisely the refutation of this view for its principal consideration.

For the rest, the dispute over the difficulty that the inventive process has to surmount is utterly frivolous in itself, because the inventor's merit is only measured by the value, the utility, of his invention. Most of the opponents of protection know this too; but they purposely take in hand an elaborate dispute of the difficulty of invention in order to make the public believe that inventions, even without protection, would grow out of the earth like mushrooms, and that every moral basis is wanting for the claim to protection of inventions. They say the essence of an invention is the idea; but the idea is always supplied by a discovery; the practical application of the idea presents no difficulty; consequently society is bound to thank not the inventor but the discoverer; but because the discovery by its nature cannot be the subject of a patent the protection of invention is in no way justified.

They try thus to bring forward the idea of the invention as prominently as possible, for the purpose of depreciating its practical elaboration, and they purposely ignore or conceal the fact that the inventor never demands a patent for anything but the practical elaboration. These tactics are very dangerous to the inventor in the process of legislation, because the masses, who ultimately make the law, will always give their support to the man who relieves them from every obligation of gratitude; they do not for the moment suspect that the edge of their decision can cut their own hands.

In cases where the simplicity of the idea of the invention cannot be denied, and yet the difficulty and importance of its elaboration must be acknowledged, as in the steam engine, sewing machine, &c. the opponents of protection declare that the merit belongs to the first inventor, who is generally long since dead, and if they cannot help acknowledging that it is only the subsequent improvements that have made the invention useful, then they declare again that these improvements were so self-evident that any man who took the matter in hand must have discovered them of necessity. Many opponents of protection who own the benefit of certain existing inventions, and the extraordinary labour of intellect applied to them, go so far in the end as to declare that the time is past for great inventions, and that we have only improvements to deal with now, which proceed spontaneously from the rich stores of knowledge and experience bequeathed to us from the past, float about almost ready in the air, and can therefore entitle no individual to any special claim.

But they who make this assertion have unhappily omitted to give us a specific definition of the great "inventions" and small "improvements." If we consider the result we suspect that there is nothing that came in its full perfection out of the hands of its first inventor. The steam engine required centuries to grow into what it is to-day; its greatest improver James Watt was still of opinion that it would never be able to do that which it does now. The greatest inventions most pregnant of consequences for our civilisation, as the steamboat, the locomotive and railroad, telegraphy, photography, typography, proceeded in their origin from insignificant almost ridiculed beginnings. And it is the many small "improvements" that have first given to these inventions their civilising significance. Without those improvements they would be ridiculed to this day as idle and ignorant endeavours, like submarine and aërial navigation, or the sun machine.

We do not mean to underrate the merit of the original inventor, but we demand that that of the subsequent inventor, the improver, be equally esteemed. And further, if the degree of merit is to be decided, the improver may in many cases have to be preferred to the inventor, and that not only on account of greater success but of greater intellectual consequence. The original inventor is very often guided by indistinct and limited apprehensions; he works without method, and cannot take in at one glance all the possible consequence of his invention. The improver, on the other hand, has the work of his predecessor to rehearse, investigate, and continue. Whilst the first inventor may be only working in pursuit of a whim, the improver's labour is always founded on knowledge and judgment, and directed towards a clearly propounded end.

The attempt of the opponents of protection to bring the original invention into prominence at the expense of the subsequent improvements is supported by the opinion that the idea in comparison with its elaboration is the more essential part of the invention. By setting the so-called "great inventions" against the "small improvements" we bring to light the fallacy of this opinion. The benefit of telegraphy is only in the rapidity it affords to the interchange of thought, and the invention would have precisely the same importance if by any other means of equal facility of application the traffic could be as conveniently provided for. But because no other means have yet been discovered by which the electric current could be superseded for this purpose, therefore the idea of applying it to the said purpose was plainly compulsory, and the only question was how to do so in the most perfect manner. And in this matter we Germans are driven to the painful confession that we with our "great invention" would never have advanced beyond Goettingen, if Wheatstone, Morse, and Hughes had not come to the rescue with their "small improvements." All the world sees that water-roads, and aërial navigation would have incalculable advantages over railways; the matter here is only to find the small improvements by which these means of communication may be established everywhere and safely!

It is rather lost pains to attempt to define the distinction between "great inventions" and "improvements;" every improvement, however insignificant it may appear, is a great invention if it makes the invented thing useful which without it was useless. In immediate reference to the improvements that are often notably described as non-essential, we wish to recall a saying of Macaulay's, which he puts in his History of England (Tauchnitz, vol. 1., cap. iii.), when he is considering the gradual development of civilisation:—"In every experimental science there is "a tendency towards perfection. In every human being there is a "wish to ameliorate his own condition. These two principles have often "sufficed, even when counteracted by great public calamities and by "bad institutions, to carry civilisation rapidly forward. No ordinary "misfortune, no ordinary misgovernment, will do so much to make a "nation wretched, as the constant progress of physical knowledge, and "the constant effort of every man to better himself will do, to make a "nation prosperous."

That which Macaulay describes here in the broadest generalization happens in every particular case, and he himself in another passage carries the application of this thought to industry and to general civilisation—the thought of the process towards perfection by inappreciable degrees of improvement. Macaulay certainly supposes an unconditional energy of the individual towards improvement, an energy which exists independently of all external conditions and re-acts on them. This may be conceded if we add that the direction of this energy is guided for the time by external conditions.

The energy directed to the acquisition of property is common to all men, savage and civilised, alike. But where there is no power for the absolute protection of property the endeavour to acquire property has to give place to the energy directed to the attainment of that power. And this is the case of all inventors in the countries which provide no or no adequate protection of inventions. It is thoroughly natural that inventive energy should there be absent, or only active to a limited extent.

Regarding the question purely in the light of the abstract principles of legislative philosophy, it is just as easy to conclude for the abolition of the protection of inventions as to defend it. In certain lights the existing right of property of the individual may in fact be disputed, and Rousseau we know succeeded in bringing forward the preponderating disadvantages to civilisation in a striking form. It must also be conceded that the only innate right we know is the right of the strong against the weak. Let the advocates of protection take this fact to heart, that they may not grow weary of agitating for their object and may really grow to be the stronger party. In the end, too, this question will be settled by the stronger, *i.e.*, by the majority in Parliament, and their task will then be to controvert the speeches of those who have only studied manufactures in their libraries or in the office of the officials of the government.

The inventor's claim to protection of his invention is founded without doubt on the same principles as the rights of property are. Just as the capacity and right of earning would be objectless, if the right of possession was wanting to the trader, so are the capacity and right of inventing futile where the protection of inventions is wanting.

In certain provinces of invention, in literature, the sciences and arts, that right of possession is unconditionally acknowledged and its protection provided for by all civilised states. In this case the legal provisions harmonise precisely with our definition given above, of the distinction between invention and discovery, in protecting nothing but the method as a whole, but leaving free the application of the general idea, the discovery. This makes the protection in some cases certainly illusory, as, *e.g.*, in scientific works, whose value is only in the discovery and not in the method. But the scientific student, the discoverer, has himself no interest in the method of his work, and must desire the greatest possible publicity for his discovery; moreover he can always compel mention of his name, and there is therefore in the free use of a discovery no actual flaw in the law, *i.e.*, no injury of the discoverer's rights to discover.

The main distinction between the manufacturing inventor and the scientific man or artist is that the former only works for material gain, whilst the scientific man and the artist work purely for their interest in science or art, and their first object is personal recognition; after recognition comes necessary material compensation. Whereas the materials for prosecuting scientific or art labours are generally within reach of the most needy, and the prosecution can be managed by the scientific man or artist alone by himself, the prosecution of most inventions in manufactures demands large means for procuring material and working power.

But the position of the inventor in comparison with that of the scientific man or artist is yet more unfavourable. With the recognition of exploits in science or art that of the individual scientific man or artist is necessarily connected, *i.e.*, the value of a work of art is not only estimated intrinsically, but with regard to the name of the artist, and the scientific man is not only paid for the service he has rendered, but also for what he is perhaps still going to render in the future; finally, the public themselves are watchful against forgery or other abuse of the name of the scientific man or artist. Here therefore, in addition to the protection afforded them by the law, they have advantages freely accorded them by society.

The inventor lives in diametrically opposite circumstances. The invention is only estimated intrinsically and according to its usefulness, nobody cares the least for the inventor. Now, seeing that good counterfeits of inventions have precisely the same value as the inventor's own productions, he would be seriously damaged by every clever or wealthier imitator if there were no law to protect his invention against imitation.

The protection of inventions has therefore precisely the same object as protection in the provinces of literature and art. But it is incomparably more important and necessary to the inventor than it is to the scientific man and the artist, because the inventor as such finds no recognition, but is entirely dependent on the profitable realisation of his invention.

The opponents of the protection of inventions who recognise the necessity of inventions for the development of civilisation, maintain that inventions even without protection would spring up as they were wanted, and to support their opinion say that with general education every technical man is capable of making the invention that he sees to be necessary for himself, and that the initiative which the inventor naturally gets is enough to compensate his pains.

As to the first clause of this argument, the facility of invention, we think that we have elucidated this enough already. As to the inventor's initiative, we must observe that in most cases this ceases to be effectual immediately when the invention is proved to be useful, and has been adopted in spite of existing prejudices. But it is only from this moment that the inventor can hope for profit. The initiative would in fact be an advantage if the public were always capable of distinguishing bad work from good. But this is only very seldom the case; the blunder is commonly only detected after repeated disastrous experiences, and even then what is generally recognised as the proper cause of disappointment is not the bad elaboration, but the invention itself is abandoned as intrinsically useless.

The inventor knows that his invention only maintains its full value with faultless elaboration, and will therefore go to work with extreme conscientiousness in the choice of materials and in the process of working. The rival, on the contrary, is trying to decoy the public with low prices, and to make the same profit as the inventor, must try to be sparing in provision of materials and labour. The result of this process is, as we say, a fraud on the public which ends in the complete rejection of the invention. The inventor has therefore to bear, besides the natural disadvantage of competition, the immeasurably greater damages of seeing the adoption of his invention altogether frustrated. In this is the reason that really valuable foreign inventions have fallen into such disrepute in Germany that they are not used at all.

The assertion that the inventions necessary to the development of civilisation are made without protection is therefore still unproved, and further, facts entirely refute it.

Let us hear what M. Moigno says in his well-known article against the Germans :—" Le génie allemand n'invente pas. Or, l'avenir est à " l'invention. Il n'invente pas. J'ajoute qu'il ne croit même pas, ou

"croît à peine à la possibilité de l'invention ; cela est si vrai, qu'en Prusse,
"et c'est une anomalie révoltante qui a mille fois désespéré nos inven-
"teurs, il est comme impossible d'obtenir la sanction d'une découverte
"faite à l'étranger."

We are not bound to believe that the learned abbé himself thinks we have not the gift of invention ; it only suited him for the moment to argue from our insufficient protection of inventions, and the small number of inventions patented in Germany, the lack of inventive capacity in the Germans.

The fact that Germany has the smallest number of patents of all civilised countries cannot unhappily be disputed, and so far Moigno's assertion cannot be refuted.

It is of the nature of the case that the news of the most widely published technical journals are principally made up of new inventions, and the journals, as a matter of course, notice the home inventions first. Now if we examine the contents of American, English, and French journals, such as the Scientific American, American Artisan, Engineer, Engineering, Mechanics' Magazine, Génie Industriel, and others, we find that barely from three to five per cent. of the inventions they publish are of foreign origin. On the other hand, the more diffusive German technical journals, such as Dingler's Pol. Journal, or Huelsse's Pol. Centralblatt, can only be maintained by taking up 80 to 90 per cent. of foreign inventions.

It will not be disputed that these figures furnish matter for serious reflection ; they show that the demand for new inventions in Germany is scarcely covered to the extent of 10 to 20 per cent. by the Germans themselves. Now, seeing that the inventive capacity of the German has been long since on record most unmistakeably and prominently, and is daily exemplified in foreign countries, this phenomenon can only be explained by the inadequate protection afforded to inventions in Germany paralysing the efforts of the inventor.

Nobody certainly can deny that the promotion of new inventions is for the general good of civilisation ; but they will not allow the necessity of protection as a means for promoting inventions, and maintain besides the uselessness of protection to the inventor and its hurtfulness to society.

As to the uselessness of protection to the inventor, we may observe that the state has to regulate the law in such a manner that it satisfies all the conditions of protection ; if after that it fails to give the inventor the benefits expected that is nobody's fault. For the rest, America, England, and France show that the inventors are very well off under the protection asserted to be so useless to them. The pecuniary productiveness of an invention is essentially determined by the requirements of the period ; he who errs against this consideration has no right to complain of his want of success. The invention of railways and telegraphs in the days of the Cherusci would certainly not have been very profitable under the strictest patent law. Nobody can think of calling for a law by which the public is compelled to buy an invention.

If the protection of inventions does not promote inventive activity, then it must either impede it or be without influence upon it. The assertion that it is without influence has never yet been made, and we can therefore pass over that ; it is best refuted by the vehement dispute on this question that has continued for years.

But, if protection had the effect of impeding inventive activity, then the countries where it does not exist, such as Holland and Switzerland, must be especially distinguished for inventions. The Swiss Polytechnical Journal* of Bolley and Kronauer, as far as we know the only technical periodical in Switzerland, mentions in the years 1869 and 1870 only eight applications of the mechanical industry of Switzerland; all the other contents of the 356 pages, large quarto, of these two volumes are, substantially at least, derived from foreign, *i.e.*, not Swiss, communications. Among these eight communications we find the description of the Righi railway and the Zurich waterworks; these communications consist of laudatory notices of Swiss manufactures without a description of the processes. Only two inventions, so far as we know, have been produced during the last three years from Holland—the so-called pump-wheel, and another machine for raising water constructed on the principle of the old science of irrigation.

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* This journal has not appeared for two years, and has not yet found a successor.

Experience teaches us therefore that those countries in which the protection of inventions is liberally maintained and energetically managed have the greatest number of inventions to show, and that, on the contrary, those countries in which there is no or inadequate protection produce the fewest inventions. If you acknowledge a causative connexion in these facts you cannot avoid the consequence of acknowledging that the protection of inventions is necessary for the interests of the community.

The rightness of this conclusion has repeatedly been manifested in quite another way. The experience of the industrial world and of the public in reference to industry in Germany is not to be misunderstood; in no other country is it equally difficult to introduce new methods, new tools, or generally new inventions. Take into account the great energetic activity of the Germans and their contemplative tendency, and this very remarkable phenomenon can only be explained from external circumstances, and we think we can prove that it is indirectly a consequence of the inadequate protection of inventions.

If, as we have shown, the number of German inventions is so remarkably small, this is because the German inventor under a sense of his unprotectedness only ventures very seldom to carry an invention into practice. The opponents of the protection of invention, it is true, will explain the phenomenon otherwise, but they would perceive the error of their view if they would take the pains of inquiring more particularly into the fate of really valuable foreign inventions in Germany. The foreign inventor has, naturally, no more right in Germany than the native, *i.e.*, he gets no protection at all, or at most a patent in conformity with the existing law, and this awarded for such a short time that the expenses of a systematic and business-like application of the invention are not covered.

The consequence of this is that most foreign inventions can be used in Germany by everybody at will, and this has produced the status that many opponents of protection value so highly, namely, the most unlimited competition. The question is now, has this condition of German industry been productive of benefit or of harm to the German people? We maintain that this condition has damaged German industry, and the public that wants its produce, in the highest degree, and we add that it is precisely in such an intelligent and industrious nation that the damage must be so distinctly manifested, as in fact it has been.

In Germany all discoveries and inventions are generally noticed with greater attention and intelligence than in other countries, and the principal use of a new invention is apprehended immediately; it must therefore have happened without fail that the application of most inventions would have been very soon tried also here. But, in consequence of the condition described above, the German producer has a great many competitors; he dare not therefore devote protracted and costly experiments to the elaboration of a new invention. He dare not pause to think of educating a staff of artisans for himself; he has to work for profit immediately, and to work more cheaply than his competitors, he has to be sparing of material and wages. Under these conditions it is no wonder that the public gets cheaply but very badly served, and entertains on that account an almost insurmountable aversion to all novelties. The many little useful things for using in and about the house which are sent in great perfection from America and England are sold by every hawker directly they appear in Germany, often at a tenth part of their original price. But they are then for the most part so bad and unfit for use that the public perceives that it is swindled in spite of the low price, and prefers to do without these articles. But the same thing is true of much more important objects.

Now why did the sewing machine long after its useful completion in America still require so much time for its introduction into Germany? The blame of this lies only with the unskilful entirely useless imitations that every locksmith or blacksmith attempted. Public opinion was thus so much confused about this machine that even technical men not long ago were disputing the extraordinary performances of the sewing machine. If Howe, Wheeler and Wilson, Grover, Baker, Singer, and the rest had found an effectual protection of their invention for 10 or 15 years in Germany they would not have despised a regulated trade in their machines, and such a long ignorance of the interests of all parties would have become impossible. We say of all parties, for if, on the one hand, the purchasing public was misled and injured, so, on the other, nothing but a quite unhealthy industry could be introduced under such conditions, which at first perhaps only caused disappointment through ignorance and incompetence, but ultimately deceived maliciously.

If it is asserted therefore that these conditions benefit the small struggling producers, that is (quite apart from considerations of morality) a vulgar error. If the "small struggling producers" had had 10 or 15 years to study really good machines, they would perhaps have become competent to construct a useful machine with small means. This was not the case; they learned nothing and earned nothing also with their bad workmanship, but in the meantime their position has very much changed for the worse. Instead of the legal protection of invention, a very much more exclusive, and decidedly more dangerous, power is introduced, namely, large capital. The carrying out of inventions by joint stock companies, with the help of millions of thalers, cannot be prevented by the state, and yet it involves a power that shuts out all competition at once and for an indefinite time, but not only fails to promote inventive activity, it suppresses it. It is a well-known fact that most great manufacturers are opposed to the protection of inventions, quite naturally, because they are bound to adopt new inventions if there is any prospect of their being applied by others, as, under legal protection, they are likely to be. But the larger the factory is, so much the more costly are the tools, and the change of method which a new invention requires. This is the explanation of the not unfrequent incident in England, that large firms buy up good inventions relating to their manufacture, but do not apply them. This puts them in a position to continue for a time longer to use the same tools and method.

We have purposely introduced this incident because it is frequently used as an argument against the protection of inventions. The fallacy of this evidence is evident. If the invention is not protected it could certainly only happen in rare cases that it should be suppressed by purchase. But, apart from the fact that the suppression by purchase can only be of temporary effect in any case, and that it is doubtful whether, if no protection existed, the invention would be made and carried out at all, such an incident only shows a flaw in the patent laws of the country.

If therefore, on one hand, protection opens to the needy inventor the possibility of procuring working capital, on the other hand, it serves as the most effective means of counteracting the predominant power of capital.

Notwithstanding that the facts brought forward and the explanation of them given are indisputable, still the opponents of protection persist in decrying it as ruinous to industry and society in general. They detect in the protection of inventions a limitation of free competition, an artificial dearness of necessary things, a source of endless lawsuits and persecutions among the producers, and in the end they declare a patent law doing equal justice to all claims to be a practical impossibility.

We have shown above that an entirely unrestrained competition can often result in great loss to the producers and purchasing public alike, and that an effectual protection of invention would for the most part dissipate this evil. But we are of opinion that the state's gain by free competition in manufactures does not consist in every man attempting to imitate everything he sees, whether his imitations be good or bad indifferently, but in every man producing really valuable things, and being able in every case to apply his labour successfully.

Now it is a fact that every inventor feels himself morally elevated by a patent. The patent gives him positive confidence in his own powers of working, and he considers himself bound to give practical proof that his invention is very valuable. The direct consequence of this is that the inventor labours to carry out his invention with all his intellectual and physical strength, and influences his colleagues in the same sense. In this circumstance, which the opponents appear most to overlook, lies one of the strongest reasons for the introduction of protection, and that a purely moral reason, which has such an invigorating effect upon industry that competition is not only unhindered, but materially promoted by it. Certainly we do not understand, among the results of free competition, that a nation should desire a senseless process of imitation such as might exist in China, but the earnest energy that always seizes on the lead and despises the pursuit of a beaten path.

But, if the opponents of protection believe that as the sum of applied inventions increases, so, in the same degree, that of inventions still to be made diminishes, and that competition is restricted in consequence, they again show their incompetence to understand the conditions of industry and technical matters, and in this case it is useless to say more on the subject. Competition, in the sense implied above, will, in fact, surcease when invention is left unprotected. Every really inventive mind loses courage if he is not in a position to keep his invention absolutely secret; the consequence of this is that nobody learns anything, and the labourer deteriorates into a senseless block, a mere lifeless tool. In this way another competition is attained, but it is that of spiritless, utterly depressing, mechanical labour, followed in the end by that of hunger.

Some separate branches of manufacture have, beyond dispute, come to a high development in Germany, but let us be honest and confess that we owe this success far more to our persevering industry and frugality than to our inventive activity. However painful it may be to hear, it is nevertheless only too true, that the general characteristic of German industry is the want of self-reliance; as manufacturers we have been and are little else than imitators of the English and French. And this explains why it is that the manufacturing man in general, and even the scientifically educated technical man, does not assume the same social position in Germany that is unhesitatingly accorded to him in England, France, and America. To us he appears as nothing better than a workman having no independence of intellect, and who might be replaced by a thousand at any moment. The cause of this phenomenon is that the independent labour, which personal inventive activity must precede, has no legal protection in Germany. The cause is certainly no want of inventive capacity. That is proved by the many inventors of German origin domiciled abroad.

When the opponents of protection of inventions bring forward as a reason against it the artificial dearness of necessary things, they cannot be seriously saying what they mean. The only possible occasion for this would be that the inventor sells the object of his invention too dearly. But seeing that before the invention the public did not possess the object at all, it cannot be regarded as indispensable, nor the price of it described as an artificial dearness.

Complaints of the high price of newly-invented objects protected from imitation by patents are often founded on a mistake, a lack of judgment. As stated above, the inventor's work must be excellent in order to win general adoption of his invention by a faultless production; he is compelled to select the best materials and to pay high wages. He works therefore at great cost and very precisely in the interest of the public.

Then, in order not to make the sale impossible by a price altogether too high, he must be contented with a very moderate, and, in the commencement, almost quite unsatisfactory profit, and only after he has succeeded in creating a great wholesale demand at that price does he attain the desired reward of his exertions.

As to the disputes and lawsuits of manufacturers among themselves, they might admissibly be passed over with the remark that nobody need trouble himself about them; they are the concern of the disputing parties and of the law. From the circumstance that the peasant farmers are generally very fond of law, and often waste their house and home in disputing a few square feet of land, nobody will deduce a necessity for abolishing the right of freehold property.

A favourite recourse of the opponents of protection is to point, in defence of their opinions, to England, where in fact not unfrequently endless patent lawsuits are carried on which result in the ruin of the patentee. Notwithstanding that the evils of the English legal proceeding are of world-wide notoriety, notwithstanding the incessant and loud complaints of the English themselves on the matter, still our opponents find it more convenient to make, not the form of legal proceeding, but the protection of inventions answerable for the abovementioned circumstance.

The difficulty of carrying protection of invention into practice must in some respects be acknowledged, especially from the position of the infallible, all-presaging legislator. But the difficulty is still only one of practice, and if the principle of the necessity of the protection of inventions is acknowledged, you must not shrink back before the practical difficulty of its application. Settle it in the first place as well as you are able, and with a good will, in the course of time the defects will be able to be removed as they come to the surface.

The difficulty of a patent law only lies in that of defining the idea of the novelty of an invention, and because every attempt to make this definition purely objective leads you only to the absurd conclusion that there is nothing new under the sun; you must be satisfied with making the definition "conventional." Let the inventor advocate the novelty of his invention himself, and when disputes arise let a jury, composed of manufacturers and technical officials, decide them in an open court of law. The invention is intended for the age and the country where it is to be applied; it would be ridiculous therefore and opposed to the interests of the age and the country to dispute the novelty of an invention on the ground of musty old pamphlets written in various languages. If the inventor have derived his invention from these sources he still deserves, if he carries out the invention in conformity with his period and makes it beneficial to the country, just the same reward as if he were the first who had made the invention; for the general idea of an invention is of infinitesimal importance in comparison with its application.

In other provinces of invention, taking the word in its most general sense, the rightness of that proposition has been long since admitted. It has been shewn that Shakespeare derived the plots of all his plays from well-known writers of his own time. But what would you say of a critic who should venture to compare the immortal productions of the greatest poet of all time in artistic value with the dull and lascivious tales of a Bandello or the dry chronicles of Hollinshed? Still further, every new edition of an old literary work altered by textual or material explanations, every translation also, stands under the assured protection of the law.

Having considered the objections brought forward against the protection of inventions, let us add a few remarks on the essential bases of a patent law.

A patent of invention is to confer on the inventor for a certain time the exclusive right to enjoy the benefits of his patent, *i.e.*, to produce a certain object or apply a process of work. The right is only founded on the interest of society in new inventions, and on the circumstance that the inventor requires a certain time to make his invention practically useful and remunerative. The right is not to have the character of a privilege arbitrarily awarded, something like that the apothecaries enjoy, but it is to consist purely in a reciprocal contract between the inventor and society, a reciprocity which ceases of itself, on one side, with disproof of the novelty of the invention; and on the other side, can be put an end to at any moment by expropriation on the part of the state [*sic*].

The patent is not to be awarded or assigned on the ground of a decisive preliminary investigation; it is to be, on the contrary, a self-evident right which the inventor can claim, on the bare assertion of the novelty of his invention, by application to the proper authorities; and it is to continue in force during the legally assigned period as long as the novelty of the invention is not controverted by a legal decision.

By a new invention we must understand every invention which has not been applied, in the form adopted by the inventor and in the country in which the patent is taken out, since a certain time to be determined more precisely.

The idea of the novelty of the invention can only be arrived at in the manner here described, because society is not concerned with the general idea of an invention, but only with those inventions that have a practical existence, and because the cessation of the application of an invention proves that it was not adapted to the period, or that the first inventor had not the intellectual or material capacity for its practical application.

On the registration of the invention a detailed representation of it, with statement of its object, and all those details to which the protection is to refer, must be deposited. This representation must be multiplied by printing and sold at cost price of the printing. It has to serve for the information of the public and for the grounds of any legal proceedings that may be necessary.

After a certain time, to be determined more precisely, the patent expires; during this time the inventor has to pay a graduated rising scale of fees to the state. These duties are to be applied to the maintenance of the patent office and the officials connected with it, to the establishment of libraries and museums of applied science, and act as a compulsion on the inventor or patentee to the application of the invention. The application of an invention, in the sense of its widest possible propagation, concerns, as has been shown, the interests of society. Now it is clear that this object cannot be attained by a provision in general force,* but which must always limit its operation to demanding evidence that the invention has been carried into practice once within a given time. A patent fee, on the contrary, increasing at a fixed ratio, will in most cases fully answer that purpose, because the inventor will not be disposed to continue payment of the dues if the demand for his production is insufficient, and will prefer in such a case to abandon his patent.

The assertion that the protection of inventions should be gratuitous, *i.e.*, the costs it imposes on the state should be met from the general taxation, cannot be justified in principle or in practice. In the first place, the protection is beyond a doubt granted for the inventor, and he must therefore in the first place bear the costs that arise from it himself. Society is only so far concerned in his invention as it can use it, and should not therefore be called upon to pay one farthing for any invention in advance. If the invention is useful, the inventor has the opportunity of making society repay him for his expenses; if it is useless he must not transfer his loss to others.

Seeing that the inventor himself, at the time of taking out his patent, is often not yet in a position to bring great sacrifices to his invention, the certificate of registration might be granted free of expense, or against a small payment for registration dues.

But after the inventor has come into possession of the patent, he must also be in a position to pay about such a tax as concurs with the regulations existing in England, because even the largest payments on that account are of no consequence in comparison to the other sacrifices which the inventor must devote to the successful carrying out of his invention. If Mr. Hughes was obliged and enabled to work 20 years and more, as is said, on the invention of his telegraphic type printing, he would not find the gradual payment of, perhaps, 1,000 thalers too inconvenient.

In conclusion we must be allowed to mention some, as we think, inefficient means of protecting inventions.

It cannot be denied that a preliminary investigation of his invention may be of the greatest advantage to the inventor, if the preliminary investigation is confined to the instruction of the inventor. In drawing up a patent law it might therefore be very advisable to take into consideration the establishment of a functionary working for that object. But we protest altogether against a decision as to the award of the patent being pronounced by the investigating officials, because we cannot concede to any corporation, however enlightened, infallibility of judgment. Previous experience that the same investigating functionaries have not unfrequently reversed in one sense or another their own decision, must have called attention to the untenability of institutions of that kind. A dispute, a complaint, requires naturally to be finally decided; but this is done by public legal proceeding, with the complicated apparatus of hearing witnesses and advocates, and the decision is finally pronounced by a jury chosen by the parties at issue for themselves; so that even the most prejudiced must allow that everything has been done that humanly could for the establishment of the truth. Such an authority will never be attained by the votes of a government office at a secret session!

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* *i.e.*, through the whole duration of the patent.—*Trans.*

A patent for only three or five years is altogether insufficient for most inventions, because the arrangement of the machinery for carrying out the invention on a large scale often requires more time than that, and not unfrequently twice that period is necessary to bring the object into consumption to an extent worth mentioning.

Many opponents of protection of invention, who acknowledge the necessity of encouraging invention, have suggested, as a substitute for the patent, that the inventor be rewarded by the state, amongst others, Michel Chevalier, on the national reward that was granted in France to the inventor of photography. Now such a delegation of a man's rights may content the French, but we, on behalf of the German pepole, cannot protest loudly and often enough against it, namely, against granting a reward, against conferring a grace, on a man who is claiming a right. Rather abandon the thought of promoting inventions altogether. Do not say that such rewards are settled by provisions of the law, and may so far be regarded as based upon the man's right; theoretically, by the sound of the words, this may be true; but practically the inventor would be left at the mercy of the judgment of an appointed functionary influenced by all imaginable circumstances. Such a proceeding tends, of necessity, to moral corruption, to the most revolting beggary and greed after titles and decorations. Let Germany beware of it!

It is very easily conceivable that the inventor of an invention in itself valuable and opportune, should find, in its application, no compensation for his sacrifices and labours; and in this case his friends, his colleagues in his profession, all who make use of his invention, are under a moral obligation to assist the unfortunate; but in the interests of public morality such assistance must never become a rule, never an ostensible act of the state.

Out of our deep and honest conviction we cannot be urgent enough in recommending that the protection of industrial inventions be claimed as a right. The most defective patent law which recognises on principle the protection of inventions for a right is preferable to the most benevolent and efficient state regulations; for this reason, that the last always leave the inventor dependent on the temporary doctrines of the governing functionaries. The promotion of inventions undoubtedly concerns the interests of society, but only to the extent of the advantage that accrues to society from the production of new objects of value by opening up new sources of acquisition. But this can never happen but when the invention is carried out by morally and intellectually independent men. Imitators slow of intellect, cheapening hucksters, labourers devoid of spirit and energy and self-reliance and originality, will never carry the industry of a country to vigorous development. But independent manufacturers of every rank will never be found but where every improvement of manufacturing performance is legally protected, where each individual has a perfect confidence that he can win for himself with a new invention, however modest, an incontestable claim to the recognition of his industry. This confidence will never be inspired by a reward or other subsidy that depends on the opinion of a government official; the inventor must have the conviction that he is in a position to defend his own right for himself on the ground of an unequivocal law.

Finally, let us look once again at the saying of Macaulay's, quoted above, and examine the deep truth that is told in those few lines.

The energy of the individual after the improvement of his position includes, in its broadest sense, inventive industry. According to

Macaulay this energy, combined with the advance of learning, has impelled civilisation in an incessant process of development, and richly compensated the peoples for every cross of fortune and every Government, however bad. The revolutions that have been accomplished during the last 100 years in the social and international relations of the peoples are almost greater than those of the preceding 17 centuries, and yet this period shows no especially sanguinary or long-continued wars, nor deep-seated struggles of opinion; on the contrary, the public apprehension has repeatedly fallen short of the conditions that really existed. These revolutions have been so often accounted for by the influence of industry that this need not be repeated here; but the latent origin of the great changes is, to use the words of Macaulay, the energy of the individual directed to the improvement of his position. The cultivation and furthering of this energy must, therefore, be apprehended as an inevitable necessity of civilisation. Moigno only describes the outside appearance, the result of this energy, when he says, "The future "belongs to invention!" S.

(*Translated by J. W. Mollett, B.A.*)

APPENDIX R.

PROJECT for a PATENT LAW by the SOCIETY of GERMAN ENGINEERS.

Dr. KLOSTERMAN.

The protection of inventions has for a long time been the subject of a lively conflict of opinions, which was originally started in the literature of social economical science, echoed in the chambers of the German Reichstag and the English Parliament, and in Holland has already brought about the complete abolition of patents.

It is not disputed that the German patent laws need alteration. The laws prevailing in the several States belong to several quite distinct systems of patent protection; in the north, namely, to the system of preliminary investigation, and in the south to the system of registration on application (Anmeldung's system). The award of patents for the Prussian, Saxon, Bavarian, and other territories which have no validity in the other States of the Empire, disturbs the unity of traffic, and destroys the efficacy of the patent protection.

In the constitution of the Zollverein, the limitation which the patent monopoly of a separate State imposed on the free course of traffic between the States of the Verein was so far removed that the patentee was allowed to keep the monopoly of manufacture, but deprived of the monopoly of sale. The Prussian patentee is not entitled to prevent the import and sale of imitations of his goods into Saxony where his patent is not in force. In spite of this limitation of the patent protection, the introduction of the Saxon locomotive (which is provided with a break patented in Prussia but not in Saxony), into Prussia could be barred by Article III. c. of the agreement of 21st January 1842; and the traveller was thus sensibly reminded that the unity of law in Germany is not yet fully established even on the territories prescribed by the constitution of the Empire.

It is also publicly known that the present Imperial Government is not inclined to the introduction of a common system of patent protection for the German Empire. According to their opinion the general legislation on the subject (which Art. 4 of the constitution of the Empire requires), should simply consist in the abolition of patents of invention.

But there is an unwillingness to proceed at this moment with such a measure, because the views of the members of the Legislature are not yet quite clear on the subject; and because the actual condition of the German law is so near an approach to a complete absence of protection for inventions that, in the interest of the views of the opponents of patent protection, there is no pressing occasion at hand for a change.

If you inquire the views of other classes who are interested in the question as originators or appliers of inventions, as representatives of jurisprudence or of social economy, you meet universal discontent with the present condition of the law, but a great difference of opinion as to what should replace it.

The free trade school in Germany, which includes eminent statesmen, great manufacturers, and the most eminent names of the press, has declared the most uncompromising war against every form of protection of inventions.

This school bases the law of economical progress on the unchecked freedom of trade. It declares that it is irreconcileable with the public advantage that any service should claim any other reward than that which it can obtain from the natural balance of supply and demand; in the words of the poet:—

> "When the rose adorns herself
> She ornaments the garden."

Its disciples see in the unchecked struggle of the individual for the greatest possible advantage the safest assurance for the prosperity of the whole, and in the untrammelled competition of all individual efforts the greatest pledge of the progress of the community.

It is not necessary to show how highly this principle of free co-operation in effort has raised the national prosperity, since it has gradually worked its way from the school of the national economists into the Legislature, into the public institutions, and into the whole system of trade. In just appreciation of the laws of nature that rule humanity, it has removed the host of conventional and dominant impediments, which stood everywhere in the way of the free development of human powers. But with the growth of general prosperity the gulf has widened also which separates the misery of the ever most numerous lowest class of society from the height that the favoured individual has succeeded in attaining. The knowledge of this gulf, and of the misery that was in former days endured as a necessity of nature, has increased, and out of this knowledge have sprung up the schools which, whatever their theoretical errors may be, are united in the practical object, by destruction of social distinctions, by overthrowing their foundations, to submit all men to the same lot, *i.e.*, to the same misery. To refute socialist doctrines is not to remove them, to expose their errors is not to disarm them, for they are not rooted in the understanding, but in the natural craving of humanity after equal, and, as much as possible, enjoyment of existence. The perils of socialism are only to be met by the practical guidance of social economy, which has come to light in our age as counterpoise to the one-sided tendency of the school of free trade. This practical economy recognises that man is not, like the rose in the garden, a natural being merely, but that he is at the same time a moral being; that, therefore, the principle of reckless egotism cannot rule in his social economy as it does in nature, but must be kept under the sway of the principle of duty.

The consequence of this then in our province is, that certainly under certain circumstances performance is to be rewarded with a higher price than that it would sell for in the market. The principle follows that all labour must demand the price which the labourer requires for an existence worthy of a man. Hence the function of the legislator to protect the weaker classes of the labouring population, women and children, from the reckless selfishness of others, to support the struggle of the working classes by the formation of societies and trade unions (Gewerkvereine), and to regulate supply and demand on the labour market. It is true that trade unions have in many cases blundered into the path of reckless egotism, and often done great injury to trade and the workman's good by the means they have chosen. So much the more is the principle recognised that the legislator is called upon to interfere to regulate the conditions of the labour market, where such an intervention is necessary for the prosperity of labour. We ask whether, from the point of view of such legislation, the labourer in the field of intellect also, especially the inventor, has need of a protection which secures to his labour its adequate reward.

The invention claims the protection of the law in the interest of the inventor, and for the sake of the success of the invention. In both respects its claims are rejected by the free trade school. The inventor gets, say the supporters of the anti-patent movement advantage enough in using his invention himself, and in the priority or lead that it gives him over his imitators. This natural monopoly generally suffices, it is true, for such inventions as can be kept concealed, so that inventors very often disdain the protection offered them by the State, and trust more to their own precaution in preserving the secret of the manufacture than to the help of the law and police against unauthorised imitation. But these cases are exceptional, as with most discoveries the secret of the manufacture must be abandoned with the sale of the prepared goods. Add to this, that the inventor, as a rule, has not the means and opportunity of carrying out his invention for his own account. The inventor is, as a rule, not a manufacturer but an engineer; he is not a capitalist but a worker, his wealth is in his talents and his knowledge. The inventor can therefore in most cases only reap the fruit of his invention by transferring it to others for a price. But this is only possible when a right can be transferred, *i.e.*, if the law makes the capacity of applying the invention dependent on the inventor's assignment. From this arises the pressing interest of the inventor in a legal arrangement which enables him to transfer the use of his invention and to realise it as a profitable right. This claim is indeed not, as has been maintained, a postulate of natural equity; legal dogmas in general do not arise of necessity, but freely of the activity of human reason. Even the property in land vested in the man who first cultivated and enclosed it, is not such a postulate of natural equity: it is unknown to the nomadic tribes. But on the other hand, energetic cultivation is not possible unless the exclusive ownership of the produce is secured to the tenant of the field, and hence the tenure of landed property has arisen among agricultural people of necessity, and for the purpose of promoting the most productive system of cultivation. Now the protection of inventions is in no sense demanded with equal or nearly equal necessity for the promotion of manufacturing activity. For even without any legal guarantee of the inventor's rights, discoveries will at all times be made under the pressure of manufacturing competition and scientific inquiry, whereas nobody would dream of cultivating a field without the right of exclusive enjoyment of its produce. The legal protection of inventions therefore can only be directed to assist that pressure and to secure to the originator of the invention an advantage additional to the natural fruits of its application. It is moreover beyond dispute that without such a legal protection securing the inventor in the undisturbed realisation of the produce of his intellect, many inventions would remain unapplied. As we should have had no railways without the monopoly legally assigned to them, as nobody would have undertaken to unite the two hemispheres with the submarine telegraph without the exclusive right obtained from both countries to this telegraphic connexion; just as little would numerous inventions, the results of tedious and costly experiments, have been made or made so early without the protection of inventions.

As a recent and striking instance we may quote the Bessemer process of preparing steel, an invention which has not proceeded in any degree from improvement of any process already in existence, but is purely the result of scientific speculation and long-continued laborious experiment, and so much so that the invention was only perfected for practical use under the protection of the patent already awarded. Besides favouring inventions, and especially those which are not accidental discoveries and improvements, but the result of investigation, the protection of inventions has the further advantage of rendering the concealment of an invention unnecessary, and securing to all manufacturers the knowledge and use of it. This object is provided for in most of the more recent patent laws by binding the inventor to publish a full description of the patented invention, that it may immediately be made generally known, and on expiry of the patent may come into general use. And during the continuance of the patent a way is left open to the manufacturers concerned to come to an agreement with the inventor for the common use of his invention, from which they would, in the other case, be entirely debarred for a certain time by the necessary concealment. The instance of the Bessemer steel brought forward shows that under such a form of patent protection not only can the inventors be richly repaid but the invention can also immediately come into almost unlimited application. The comparison, therefore, between the results of Bessemer's patented invention and Krupp's cast steel, which opponents of patented protection are fond of making, results decidedly in favour of the public advantage of patent protection.

The economical value of such an arrangement, must therefore, in the case advanced, not be underestimated. We have it is true no complete and available statistics of the results of the existing patent arrangements. Those brought forward by the advocates and opponents of patent protection are generally selected with partiality and coloured to their purpose. The advocates of patent protection advance isolated cases of eminent inventors, who by patent protection have either won a brilliant reward for their services, as *e.g.* Watt and Arkwright, or others who by the want of a legal protection have forfeited all the fruits of their invention as Gutenberg, de Caus, Leblanc, and others. But they must not leave unnoticed those inventors who have been able to reap no benefit from the monopoly of their invention, in spite of the patent protection, like Faulton, inventor of the steamboat, to whom the monopoly of his invention on the rivers of the United States resulted in a debt of 100,000 dollars. Here also the thousands of inventors of inferior rank must be noticed who lose their money in the pursuit of really barren ideas under the patent protection they had obtained.

If, on the other side, we were to listen only to the opponents of patent protection. they would give account only of those inventors who use their patent for a trap by means of which they extort compensation from other manufacturers for the assumed infringment of their monopoly. There would be, according to their representation, only two classes of inventors on principle; fools who ruin themselves, and rogues who ruin industry in general.

The inaccuracy of such one-sided representations is apparent at a superficial glance. There exist a great number of patents in all countries which are the bases of valuable and profitable manufactures, and are bought and sold at high prices. Most of the instances of the evil results of patent protection moreover do not affect the principle of the legal protection of patents itself, but only the defective nature of certain separate systems of patent legislation, especially the registration system (Anmeldung's system) prevailing in most States, which is entirely ruinous. If ever an inventor is debarred from the enjoyment of his own invention by the circumstance that others have been beforehand in taking out a patent for the invention, this is plainly not the effect of patent protection in itself, but of the vicious principle of awarding protection not to the real inventor but to the first applicant for registration. If also needy inventors are driven to sell the patents they have obtained for moderate compensation to other manufacturers, this is no evidence against the utility of the patent protection, but only an instance in which a valuable property cannot be realised without the capital necessary to work it, and must therefore very often be parted with for less than its real value.

That not only the inventor but the invention also requires legal protection for the perfect development of the latter has been already implied in the argument that without commensurate realisation the motive which even in intellectual labour cannot be found only in the satisfaction of the intellect, would be wanting for inventions which are frequently the fruit of experiments costing much time and outlay. If we listen to the friends of the anti-patent movement there is no question at all, or at least there is no longer a question in these days of an invention which could be claimed by any individual originator of it as his own intellectual property. Even the greatest inventions they teach are nothing but the sum of a number of preceding scientific discoveries and practical improvements, which at a given time is found by some one person but would just as certainly have been found by a second or third person in his absence. With the want, *pari passu* in the process of development, always appears the required invention. According to this view inventions sprout up into life like the flowers of the field, wild, and the first inventor would have no other claim for his service than the first violet, namely, the preference of novelty and rarity. But this opinion smacks of the philosophy of the unknown, and is at variance with experience. If it be true that necessity is the mother of inventions, it is just as certain that their father is human industry, and that no invention comes into life without the nourishing influence of genius and labour. Did not Aristotle wish that the spindle would turn without human hands, a wish fulfilled 2,000 years afterwards by Arkwright's invention? Does not the Society for the Advancement of Manufactures, at the head of which are our leading statesmen for internal legislation, call for a number of inventions for which they hold forth high premiums every year, and for which the mother necessity is at hand but no inventor yet?

But every inventor stands on the level of his period, and has under foot the property that belongs to the age. But the men who enlarge this property considerably, who rival centuries of stagnation in one generation of great discoveries, are not mere helpers but master architects of the edifice of human civilisation. That the steam engine did not proceed from Papin's experiments in 1690, but almost a century later from Watt's invention, is not in consequence of any scientific discovery in the meantime, but the genius of Watt was requisite to produce, from the disconnected facts already known, but imperfect in their want of connexion relating to condensation, indirect propulsion, &c., the machine which amid all the progress of theoretical and technical science has not been superseded to this day.

In the same manner Gutenberg's printing press, Arkwright's spinning machine, Stennefelder's invention of lithography, and the whole number of inventions which have immortalised the name of their originator, are not the product of chance and of plagiarism, but the result of sustained inquiry and the observations of genius.

It is, therefore, with justice demanded that for the originators of really new and useful inventions the same legal protection be provided by the legislation as to the authors of works of science and art, the right, namely, of demanding, for the communication of their invention, an adequate compensation from those who desire to make use of it.

The refusal of this legal protection, if it is limited to the single state, will result in the emigration of inventions to other countries, as it was 50 years ago with the German inventions of cement, steel manufacture, and the improved printing press which were patented and turned to money in England. If the protection of inventions were abolished in all countries, no doubt a cessation of the inventive spirit would ensue; every inventor would be at anxious pains to keep the secret of his invention in order to secure as much profit as possible from its communication or use. Many inventions would be only accessible to the public after a long time, and many perhaps, as has no doubt happened to discoveries of former times, would be lost again altogether. The disadvantages which such a concealment of inventions and improvements contains for industry cannot be overstated.

The important progress of the German beetroot sugar production rests mainly on the circumstance that the manufacturers have united into a society, and the members immediately communicated to each other all the improvements discovered in their factories, by publishing them in the journal of the society. Instead of taking advantage for themselves from the temporary enjoyment of a manufacturing secret, they give it in exchange for the common advantage of the discoveries made in all the other factories, and by this exchange the whole industry is benefitted as well as the individual.

It is clear that such a simple exchange of inventions cannot take place on the great market of traffic, because the man who uses the invention is not in a position to offer the inventor an equivalent for this useful invention. The traffic must therefore be regulated here by an equivalent universally acceptable, and this has been hitherto found in the temporary monopoly which is conceded to the inventor.

The opponents of patent protection are liberal with the statement that the patentee's monopoly is a hindrance to the progress of industry, and it is beyond a doubt that this is the case in a certain degree, and that industry would gain if the patent of invention could be replaced by another form of legal protection which should exclude nobody from the immediate use of the invention. But it is certain that the progress of industry is suspended in a much greater degree by the concealment of inventions, which deprives the public not only of the use but also of the knowledge of the invention, and that not for a fixed but an uncertain period.*

If the legal protection of the inventor must from the above reasons be considered a thing demanded by social justice and as an effectual promoter of industrial progress, then the further question remains to be answered, in what form is this legal protection to be provided?

The existing patent laws, we know, agree to confer on the inventor a limited monopoly by entitling him for a number of years to the exclusive application of his invention. But there is this difference, that in Prussia and North America this title (the patent) is granted after a preliminary investigation of the newness of the invention, whilst in other countries, especially in England, France, and Belgium, a patent is granted to every man on his simple application for every asserted or assumed invention. The investigation, whether the invention be new and the patent valid, is subject to judicial decision if the claim to the patent is to be made effective.

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* It is a fact, that precisely in that country which has most developed the patent system, viz., in North America, the progress of inventions is most lively, and that the monopoly granted to inventions is itself an incentive to new inventions. Thus the invention of the sewing machine, in which the stitch was originally knotted by a moveable shuttle, was superseded by others before the patent expired, and in these the same end was attained by upright bobbins or spiral-shaped needles. In this way the patent of the first inventor immediately called forth new inventions, which without the monopoly would perhaps not have been made until a much later date.

That the existing patent regulations in England, France, and Belgium are completely untenable must be granted at once. The number of the patents which are awarded in these countries without any investigation to every applicant grows from year to year enormous, and by leaving events to their own course we should witness the certain downfall of the patent legislation. Even the class most interested in the protection of inventions, the engineers, find themselves so much impeded in their freedom of action by the excessive number of the patents granted in England, France, and Belgium (altogether about 10,000 every year), that the Belgian Society of Engineers has voted for the removal of the patent protection, and the substitution of voluntary reward to the inventor by the trades unions.*

The absence of any preliminary investigation as to the originality and novelty of the patented inventions imposes on each individual manufacturer the obligation of protecting himself against the monopoly usurped by the non-inventor, and in the same degree compels the patentee to establish the originality and novelty of his invention against every individual unauthorised imitator. In this way patents become under the registration system a source of numerous, extensive, and expensive suits at law. The patents taken out by Christofle in France for gilding and silvering were disputed at law 167 times in the years 1842 to 1857, and as often confirmed by legal judgment. In England, where the charges on granting a patent for 14 years amount to 175*l.*, the legal proceedings into which the dispute about patent rights are carried bring such immense expenses that it often happens that the inventor is just as thoroughly ruined by gaining his process as by losing it.

The system of preliminary investigation has also been met with many objections, especially in Prussia. It is maintained that in the present condition of technical science an investigation of the novelty of the invention can no longer be carried out with certainty, because no officer could acquire a sufficient knowledge of the innumerable improvements discovered every year in every branch of manufacture. But this objection is removed if the complete description of the invention is published when it is patented, and if an opportunity is afforded to every person concerned of making good his objections to the newness of the invention.

A notice to appear might be easily combined with the publication of the description and followed by the exclusion of all objections to the newness of the invention not brought forward in a stated interval. Such a process of exclusion, as was proposed in the French project of law of 1858,† relieves the inventor of the necessity of continually defending the newness of his invention against every fresh opponent.

The objection to the Prussian investigating authorities, on the other hand, that they disallow really new inventions and refuse to patent them from general theoretical points of view may be met, and the interests of the inventor protected against such a practice by a properly regulated court of appeal on the model of the American process.

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* Rapports présentés à la section de Liége de l'Association des Ingénieurs, par M. Renier Malherbe et M. Charles Beer. Liége 1871.

† Moniteur Universel vom 3 Juli 1858. Nov 184.

If the inventor is entitled to appeal to a superior court against the adverse decision of the investigating authorities, if an opportunity is afforded to the whole manufacturing body to take part in the investigation of the newness of an invention submitted for patenting in their branch of manufacture, if in this manner a decision is once for all obtained from competent judges as to the inventor's claim, then the process of preliminary investigation will certainly protect the interests of the inventor and the industry concerned better than that of registration on application (Anmeldungs Verfahren) which perpetuates the dispute over the inventor's right and consigns him to the varying decisions of different courts of law.

Objections are also made to the form of the temporary monopoly by which inventions are at present protected. It is maintained that this monopoly is more of a burden and impediment to the whole industry than a benefit to the inventor.

Most inventions, it is true, require in the first days of their existence further practical adaptation by which the theoretically obtained idea is adapted to the object sought in its details and made profitable. Inventions of the greatest importance, like the printing press and the steamboat, produced no profits on their first adaptation for years and led to the bankruptcy of the persons who were carrying them out. Even Watts' steam engine did not begin to be profitable to its inventor until a further term of protection had been granted him by a special Act of Parliament after the expiry of the legal duration of his patent. On this experience is based the proposal to award to inventors national rewards in lieu of the unprofitable monopoly, and to give the application of the invention immediately up to general competition which will most safely and speedily shape out the practical application of the idea theoretically discovered by the inventor. There is no doubt that in certain cases such a means can be adopted, as, for example, the French government acquired Daguerre's invention by a national reward and threw it open to general use. But there is equally no doubt that this means can only be adopted in certain cases, and that national rewards can only be awarded for inventions of indisputable value and of general utility. It would be vain to demand national rewards for the large and valuable class of inventions which have to struggle for recognition on their introduction, and which only benefit certain branches of industry.

The proposal is just as unsatisfactory of leaving the reward of the inventor to the classes he benefits, as to the great unions of railway companies, mine owners, iron producers, &c., because it leaves the inventor's reward to the discretion and goodwill of the persons interested. The inventor, like the literary man and the artist, requires legal protection, securing the reward of his services independently of the goodwill of the persons interested. In most cases certainly his interests rightly appreciated tend to his getting this reward as the condition for the use of his invention, and leaving the latter where it is possible open to every man's use against a fixed premium, instead of undertaking to work it at his own risk. But, that this may happen, the monopoly of his invention must first be secured to the inventor, so that he can make the transfer of its use conditional.* The protection of inventions therefore brought back to right principles, does interfere neither with the freedom of trade nor with the progress of art industry. It is a thing demanded by natural equity, just as the kindred claim to protection of authors and artists is.

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* The proposal has already been made to couple the protection of an invention with the condition that the inventor leaves the use of it to every third party for a stated price. The proposal has also been made in the publishing trade to leave the reprint free to all against payment of a per-centage. These proposals have hitherto been rejected as unpractical, although it is acknowledged that they would obviate the disadvantages of monopoly and secure the author the most equitable reward, *i.e.*, the reward most exactly proportioned to the extent of the publication. The writer proposes to examine in another place whether such a modification of patent protection is practicable and effectual.

When the opponents of patent protection, like Prince-Smith and Schaeffle, are driven to reject the principle of copyright, and thus, finally, as a necessary consequence, to leave authors and artists at the mercy of all reprints and imitations, it is manifest that the adoption of such principles by the Legislature would throw us back centuries into an age of intellectual barbarism, and futilise the struggles by which it was dispersed.

It is not the protection of inventions that impedes the free action of trade but the imperfect shape in which this protection is afforded by existing legislation. In order to disperse the existing undeniable evils and certainly to remove the prevailing prejudices, no other measure is required than the restoration of patent legislation to its natural bases. A welcome step has been recently taken in this direction by the project of a patent law for the German Empire, which the society of German engineers has submitted in a petition to the Bundesrath, and published with an explanatory preamble. The above remarks which also owe their existence to the suggestion of the society of engineers, were already in type when it was published. So much the more is the writer gratified to find in the proposals of the project of law the same grounds of thought, that he has advocated here and elsewhere as applicable to the reform of the patent legislation.

The project recommends a process based on the principle of the preliminary examination. But this is to be in the first place purely admonitory. The inventor who will not be deterred by the dissuasive decision of the Patent Office, can demand that the proceedings shall take their course.

These consist of a public summons to appear, accompanied by a complete publication of the application and of the specification. At least three, at most six months afterwards, the inventor may apply for the award of the patent, but he must prove the successful application of his invention in Germany. The rejection of the application for the patent can be disputed by plaint at law against the Patent Office in the Imperial Higher Trade Court (Reichs-oberhandelsgericht). In the same way anybody may dispute the patent when it is granted, by a plaint in the same court.

The proposals of the project of law from which we have selected the specially characteristic provisions for the proceedings, are throughout remarkable for practical efficacy. We mention, as a very happy modification of the proces of summons to appear, that anybody interested in the refusal of the patent is admitted to make his objections good in the Patent Office, but is not obliged to appear as a party to the lawsuit.

It must be remembered that the Patent Office, as the State authority appointed for the first decision on the application for the patent, could not well be put in the position of defendant to the action; and, therefore, instead of a complaint against the Patent Office, the action must take the form of an appeal from their decision. Further, it is not without importance, that the publication of the complete specification has to be made without provisional protection to the inventor.

An uncertainty of law to the detriment of the public and the inventor would arise if, for six months it lay open to everybodyto adapt the new invention according to the published specification, and it would be difficult to decide how the inventor's right in respect of the goods manufactured in the interim, &c. should be made good after the patent was granted. In any case it would be best to limit the absence of protection during the period of publication to the case that the publication was demanded in opposition to the sentence of the Patent Office.

May the suggestions made by the society of German engineers lead to an early and beneficial reform of the patent legislation.

(*Translated by J. W. Mollett, B.A.*)

APPENDIX S.

Opinion of Mr. Renouard, Member of the Institute of France, Procureur-Général of the Court of Cassation.

I find a certain embarrassment at the commencement of my observations, as I cannot quite clearly understand the principal part of M. Michel Chevalier's reasoning.

Our noble brother says it is impossible to prove an invention; for the searching out of its origin is so uncertain. If there is no proof of an invention the consequence is very simple; there will be no patent (brevet), as our legislation decides that if there is no novelty there is no valid patent. But is the statement of M. Michel Chevalier correct that there is no certainty of invention? Is there not, on the contrary, in the movement which agitates the human mind, which improves the industrial arts, a moment when some one finds something which by public avowal was unknown before. Well, if there is a discovery there is service rendered to society. Is this service remunerable? To put the question is to solve it. All service ought to be paid for by those who enjoy its benefits. That is it. It is not a reward, but a price, a salary. M. Michel Chevalier says, that a person who discovers something new does not render a service to society. And yet to discover something, to endow an industry with a process which is more fruitful, more rapid, and less costly, is, according to the most simple ideas of common sense, both serving and enriching society. It is true that there are pretended inventions which do not merit the name. But the false and the artful things which are often brought forward do not alter the fact that one does frequently meet with new ideas and new applications which are serious, sincere, and profitable; such inventions are services, and therefore ought to be paid for. It is not always easy to decide whether a thing is really new, but the tribunals are judges of this. Questions of this kind are discussed every day before them, and they decide whether there exists in such and such a branch of industry a new process, and therefore a service rendered.

M. Chevalier will not recognise that this service ought to be remunerated. That is what before everything separates us. After having disapproved of the principle of remuneration, he criticises the manner of doing it. He is right in some accessory and remediable details; but I can in no way associate myself with his opinions.

Since the 17th century every one has found that the best way of acting towards the inventor of a new process is to concede him a temporary monopoly. If this plan is no longer approved of, I am willing that another should be substituted for it, on the condition that a substitute shall be found, which has never yet been done by anyone. It is not right to get out of the difficulty by saying that society will profit by the invention, and will not pay for it. It has been suggested that rewards should be distributed by the State.

I can understand honours and rewards being conferred for exceptional merits. I can equally understand that cases may arise, also exceptional, where the State may consider it useful to treat with the inventor, to substitute a contract for his rights, and then to make a present of his invention to society; then it is a national acquisition. What I do not understand is, the idea of establishing as a common right, and an invariable rule, that the price due to inventions should be drawn out of the coffers of the State. Of all plans of remuneration there are none more vicious, nor which present so many dangers. How shall the State proceed so as to appreciate the value of an invention? In what measure and with what guarantees can the choice between good and bad be made? Where between two dangers can be found the means of exaggerated leniency or unjust severity. This system is inadmissible.

The origin of patents is traced back to 1623, in the reign of James I. At this time the industrial monopolies which covered England were abolished, but the temporary monopolies attached to the right of inventions were retained. It was recognised that the benefit conferred upon society ought to be paid for, and that no stated price answered the purpose. Truly nothing is more just than the principle upon which this based; the reward is calculated according to the products of the discovery. The consumers would pay for the time being a little more, but ought not the inventor to be indemnified for all his expenses, his trials, his manufacture, in one word, for everything which he has hazarded. He has had the happiness of succeeding, he is reimbursed for the expenses which he has been put to, and an additional benefit is justly allowed him on what he sells.

From the English legislation, these principles were received in France in 1791; they have been legally recognized by all nations. They have passed into law among all the nations, by whom labour is held in honour; if they are all mistaken let them say so, but above all let some other means be found of remunerating the inventor for his trouble, for his expenses, and for his risks.

Let us now consider patents in themselves. M. M. Chevalier has said that patents are of use neither to society nor to the inventor. Why do they injure the public? Because they prevent rival productions. How is it that they do not profit the inventor? In not protecting him efficaciously against his rivals. It is necessary to decide for one thesis or the other. In stating that they prevent rival productions, it is understood that they are useful to inventors. The two objections cannot be reconciled to each other. I also affirm that taken separately they are without foundation.

There are a good number of profitable patents, either to the patentees or to the inventors. Inventors can sell the enjoyment of their right, for a certain time, and for certain places, either entirely or in part, to persons who work the patent. Sometimes also the inventor addresses himself to capitalists who assist him. The price of transfer benefits the inventor, the speculation benefits the capitalist, and the consummation benefits society.

I have spoken of society saying that it also has its rights, its interests must also be considered. Undoubtedly the temporary monopoly is an annoyance, but after the annoyance, after the delay, to the fulness of enjoyment due to competition, society is largely rewarded, not only by the fertile stimulus given to the spirit of investigation and discovery, and by the fulfilment of a just duty, but also by the knowledge of the invention which it possesses and which it appropriates with all security. The encouragement is of some use. Without doubt there are inventors who have no need of the privileges of law, and who place their reward higher; without doubt genius will not allow itself to be stifled under material obstacles, and the worst times have had glorious discoveries, even when persecution was the invariable reward of their authors. But laws are adapted according to the ordinary current of affairs.

The enticement of a pecuniary privilege is not a motive without power, and this positive excitement is not foreign to industrial activity so well described by M. Michel Chevalier. A proof is found in the ever growing number of patents which are taken out, and which would not be taken out if some one were not the gainer thereby. M. M. Chevalier has given examples of inventors who grew rich without patents. He has spoken of Krupp, who, in the development of a vast industry, thought it best to keep his secrets. I accept the example by which is revealed one of the most serious justifications of our law. The principal idea of modern laws on patents has been to protect society against the peril which arises from the custom of inventors of not revealing the secrets of their inventions. It would be difficult in this age of universal publicity to reckon the great number of useful discoveries which perish by secrecy. One of the real benefits of the institution of patents has been to extirpate this evil. The first condition made by law to assure an invention the privileges of a patent is a description of all the elements of the invention. If the description is not lucid, if it is incomplete, if everything is not specified with detail and truth, no patent is valid.

Between the inventor and society it is a bargain of dupes. Society retards his entrance into fruition, but its remuneration is paid by the certainty that invention will not perish, and at the end of a certain time the benefit of the bargain is accomplished for it, in complete conformity with public and private interest.

I do not deny that actual legislation has given rise to abuses. Some of them are inevitable and belong to the very nature of the thing; the greater part are remediable and are now being reformed. Some years ago they gave way too much to the pressure exercised by the pretensions of inventors; they considered themselves despoiled and dispossessed, if they were not guaranteed a perpetual monopoly. They associated themselves with the rising-in-arms of the proprietors of letters and these aimed at nothing less than to convert into perpetually transmissible property immaterial and inappropriable works of human knowledge. Without granting everything to the excessive pretensions of inventors, it was thought fit to sacrifice, not formally and in express terms, but in an indirect way, the tutelary and fundamental principle of the granting of patents without any preliminary examination. A very complicated combination was proposed in virtue of which, after a certain time for the exercise of patents, their consolidation would be pronounced, with the effect of withdrawing them subsequently from the discussions of interested parties. Thus there would be a species of patents, consolidated patents, and ordinary patents, leaving only room for cavilling and for lawyers. This combination which it was thought fit to abandon would have been the radical overthrow of legislation.

The law of 1844 was thought to do well in notably lowering the tax exacted upon the obtaining of patents, and in converting it into an annuity of 100 francs. This measure was singularly injurious to the interests which it meant to promote. It caused a vast mass of small, useless, and insignificant patents to accumulate, which pleased the fancy for 100 francs a year, and which are like the decorations on sign-boards.

These valueless patents, which cannot be refused (for their refusal in the absence of examination, would be the greatest of faults), are occasions for deception and trickery, and discredit the institution. An increase of

the tax would do away with them and would be perfectly justifiable, for a deserving patent would easily refund the increase of the tax, and an undeserving patent ought not to exist.

Mr. Tegentil's son published, in 1856, a very sensible pamphlet, with an appendix containing the extracts of a discussion in the House of Lords in 1851, in which the thesis of M. Michel Chevalier was sustained. It appears by the extracts that on the inquiry opened at this time, the increase of the tax has been energetically advocated by practical men, as a barrier to many abuses.*

APPENDIX T.

Report of Proceedings in Austrian Courts of Law for Piracy of Trade Names and Trade Marks of English Firms. By Dr. Weinmann.

Piracy of Name of Firm.

Messrs. J. & E. Atkinson, of London, *v.* Fischbach and others.

Sir,

Agreeably to your instructions addressed to me on the 25th July last, I placed myself officially at the disposal of Mr. James Atkinson, member of the firm J. and E. Atkinson, Perfumers, of 24, Old Bond Street, London, who were Exhibitors in Groups III., (Chemical Industry) and X. (Small Ware and Fancy Goods) at the Vienna Exhibition, for the purpose of assisting him as directed in the legal proceedings to be instituted against certain manufacturers of and dealers in perfumery in Vienna, for making an unauthorised and unlawful use of the name of his firm, by selling and offering for sale perfumery in bottles, having on the upper part round the neck, the name "Atkinson" impressed in the glass, and bearing labels having the name of Messrs. J. and E. Atkinson of London printed upon them; and I now beg leave to submit to you a statement of the proceedings taken, and the results attained by them.

Having secured the legal assistance of Dr. Max Schweinburg, court advocate and barrister in Vienna, application was made to the magistrate for a search warrant and an order of seizure against two manufacturers of and traders in perfumery known to make use of the name of Atkinson's firm on their bottles and labels without authority or permission, by virtue of §§ 5, 17, and 26 (*post*, 554) of the Imperial Austrian law for the protection of trade marks and other signs, dated 7th December 1858, by which it is enacted that "no one may arbitrarily appropriate the *name*, *firm*, coat of arms, or the title of the establishment of another inland manufacturer or tradesman, in order to mark goods or products intended for sale;" that "the aggrieved party is entitled to demand, even before the decision of their plaint, on the production of an authenticated sample, the seizure or other custody of the goods and materials used for counterfeiting mentioned as being in contravention of that law," further, in virtue of the law of the 15th June 1865 respecting the admission of foreigners to the privileges of protection of trade marks in Austria; and, lastly, in virtue of Art. IX. of the Treaty of Commerce concluded between Great Britain and Austria on the 16th December 1865, by which it is stipulated that

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* *See* evidence before Select Committee of the House of Lords, in the Session of 1851.

" the subjects of either country shall enjoy in the dominions of the other the same protection as native subjects in regard to the rights of property in trade marks and other signs, as well as in patterns and designs for manufactures." (*Post*, 554–560.)

As a precaution, and in accordance with § 26 of the law of 7th December 1858, Mr. Atkinson had procured, by purchase, from the establishment of a certain Mr. Fischbach, No. 3, Kärnthner Ring, Vienna, and from that of Mr. Maczusky, Kärnthnerstrasse, in the same town, several bottles of perfumery, having in the same manner as Messrs. J. and E. Atkinson's genuine original bottles the name of Atkinson's firm embossed on the glass, and bearing imitations of their labels, the perfumery contained in them being sold as being the product of Messrs. Atkinson's manufacture.

The magistrate upon having been satisfied by Mr. Atkinson's testimony as to the unauthorised and unlawful use of the name of Messrs. J. and E. Atkinson's firm by the two persons just named, not only complied with the request made on Messrs. Atkinson's behalf, by granting search warrants against the two firms, and ordering the confiscation and placing under seal of the entire stock of perfumery found in each establishment, and recognised by Mr. Atkinson as imitations of their labels, produce, &c., but likewise instructed the market inspector to accompany Mr. Atkinson to the firms in question, and execute the orders of search and seizure.

On arriving at Fischbach's establishment, Mr. Atkinson, as well as the gentlemen who accompanied him, were surprised at finding nearly the whole place stocked with bottles, filled with perfumery, bearing fac-similes of the name of Messrs. J. & E. Atkinson's firm and labels; and in a great many instances these counterfeit impressions were admitted by Mr. Atkinson to be so ingeniously executed that it required all his attention and his practised eye to distinguish the imitations from their own genuine articles.

The result of several hours' search in this establishment alone was a booty of nearly fifty dozen bottles, which were placed under seal.

In Mr. Maczusky's establishment the number of bottles of perfumery found with imitations of Messrs. Atkinson's name and their labels was not so large; the fact of the infringement was considered sufficiently established by the seizure and the placing under seal of only a limited number of bottles.

It was a generally prevailing opinion among English, and particularly American, Exhibitors that the Austrian laws were insufficient to afford foreign inventors and manufacturers sufficient protection against piracy or fraudulent appropriation of their inventions, trade marks, &c.; or, if effective, that the cumbrous mode of procedure and the delay in the administration of justice would make their application illusory. Greatly to the credit of the Austrian authorities it must be admitted that in the latter respect these apprehensions were unfounded, and, as regards the effectiveness of the laws, Mr. Atkinson's case was a test of their efficiency.

In a comparatively short time the market inspector had submitted his reports of the seizures to the commissioner conducting these cases, and the two offenders were summoned to appear before the magistrate to answer the charge brought against them of making a fraudulent and unauthorised use of the name and labels of Messrs. Atkinson's firm.

As it was Mr. Atkinson's intention rather to check the unlawful use of the name of their firm and the imitation of their labels, and to put a stop to the sale of articles provided with them, than to have the offenders rigorously punished, the case against Fischbach was settled by compromise, the latter agreeing to pay the costs, and, in the presence of the magistrate's officer, to destroy the seized bottles bearing Messrs. Atkinson's name and an imitation of their labels (the scents being restored to him), and this compromise was recorded in the judgment.

The case against Maczusky was adjourned on the defendant's plea of illness and his being unattended by a legal adviser. Taking advantage of Mr. Atkinson's temporary absence from Vienna, the defendant put in an appearance and obtained by stratagem a non-suit against the plaintiff.

Having obtained proof that a large manufacturing firm—in fact, the largest manufacture of perfumery in Vienna — extensively supplied the retail dealers with articles bearing the name of Messrs. Atkinson's firm and their labels, sold by them as genuine articles under the pretence of being of Messrs. Atkinson's manufacture, application was made in the usual form, on the 3rd August last, to the magistrate of Vienna, requesting the institution of penal proceedings against the firm Treu, Nuglisch, & Co., of Vienna, for fraudulently marking goods of their manufacture with the name of the firm of Messrs. J. & E. Atkinson, imitating their labels, and selling them falsely as genuine articles of Messrs. Atkinson's manufacture.

This application was, contrary to all expectation, refused on the ground that the plaintiffs had not proved the registration of their firm in Austria as required (so it was alleged) according to the law of 15th June 1865 respecting the admission of foreigners to the privileges of protection of trade marks in Austria.*

Art. I. of this law, which consists of only two articles, reads as follows:—

"The provisions of the law of the 7th December 1858 (Imperial Law Repertory, No. 230), for the protection of trade marks and other signs, may be extended to the trade marks and signs of manufacturers of *foreign countries under the condition of reciprocity;* the manufacturers of the respective States, in order to be granted the privilege of protection of their *trade marks and other signs*, must have them registered at a Chamber of Commerce and Manufacures of the Empire, and in all other respects observe the provisions of the law of 7th December 1858."

This unexpectedly adverse decision gave rise to a very important and serious question, interesting to all English manufacturers.

Independently of the magistrate having on a previous occasion granted in two instances an application of the same nature without making the registration of the plaintiff's firm a condition of the admission of legal proceedings, the question requiring immediate settlement amounted to this:—Whether English manufacturers, notwithstanding the provisions of the laws, and the "reciprocity" alluded to in the above law, and established by international treaty, shall be at the mercy of every one in Austria and Hungary unscrupulous enough to fraudulently mark goods of his own manufacture with the name of an established English firm, to imitate with impunity their labels, &c., and to sell goods, under such disguise, as English manufacture, to the detriment of the interests and reputation of the British manufacturer.

The law above quoted, although requiring *trade marks* and other *signs*, (an indefinite and elastic term, which is in the German text expressed by the equally vague word "Bezeichnungen") of foreign manufacturers to be registered in order to be entitled, under the condition of reciprocity, to the privilege of protection against piracy or imitation, under the law of the 7th December 1858, does not in the least indicate that the *name* or *firm* of a manufacturer shall likewise be registered in order to be entitled to protection against an unauthorised appropriation or a fraudulent use of the same.

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* *See* Annex A., *post*, 520–521.

On the other hand, the Austrian law of the 7th December 1858, respecting the protection of trade marks and other signs, is very distinct on this point. (*Post*, 554.)

In § 2 of this law it is laid down:—

"If a manufacturer wishes to secure for himself the exclusive right to use a *trade mark*, he must have the same registered in accordance with the provisions of the following section."

Referring to *names, firms*, &c., it is enacted in § 6:—

"No one may arbitrarily appropriate the *name, firm, coat of arms*, or the *title* of an establishment of another inland manufacturer or tradesman, in order to mark with the same his goods or products;" and § 7 includes in this protection also the inscriptions, labels, &c. on boxes, bottles, &c., namely:—

"All that is said in this law with regard to the marking of goods applies as well to the marks and signs on the packages, receptacles, coverings, &c."

Transgressions of the prohibitions specified in § 6 are provided for by § 17, as follows:—

"The enactments contained in § 15 (having reference to the infringements of the property in trade marks) apply *in like manner* to those persons—

(*a*.) Who unlawfully appropriate the *name, firm, coat of arms*, or the *particular title* of the establishment of another inland manufacturer or tradesman, in order to mark with them goods intended for sale;

(*b*.) Who introduce into the market products or trade articles bearing any unlawful mark or sign of the kind mentioned."

And, finally, by § 26 of the same law, it is enacted that "the aggrieved party is entitled, even before the decision is given regarding his plaint, to demand the seizure or other custody of the goods and materials employed in the manufacture of the same marked contrary to the enactments of this law."

"The magistrate, on the production of a properly authenticated copy of the mark or sign, shall there and then order the seizure to be effected."

In addition to these clear and distinct legal enactments, containing ample and effective provision as to the protection accorded in cases of an unauthorised and fraudulent use of the name of the firm of another manufacturer, the Treaty of Commerce concluded between Great Britain and Austria on the 16th December 1865 establishes, in the case of Englishmen, the *reciprocity* required by Art. I. of the Austrian law of the 15th June 1865, quoted above, in order to entitle them to the privileges of protection provided for by the Austrian Trade Mark Protection Law of the 7th December 1858.

In Article I (*post*, 563) of this Treaty it is stipulated:—

"The subjects of either of the two high contracting Powers shall enjoy, in the dominions of the other, the same protection as native subjects in regard to the rights of property in *trade marks* and *other signs*, as well as in *patterns, models*, and *designs* for articles of industry."

Referring to all these articles of law and of the Commercial Treaty, a petition of appeal against the adverse decision of the magistrate was addressed to the "Statthalterei," *i.e.*, the Political Administrative Jurisdiction for the province of Lower Austria. The "Statthalterei," without assigning any reasons, did not entertain the petition of appeal against the magistrates' refusal to allow proceedings against the firm Treu, Nuglisch, & Co., for the unlawful appropriation and use of the name of Messrs. Atkinson's firm and the imitation of their labels, and simply confirmed the magistrate's decision. (*See* Annex B., *post*, 521.)

By this second adverse decision of the superior administrative authority of the province of Lower Austria, which it was apprehended would be acted upon as a precedent in future cases of a similar nature, Messrs. Atkinson, and all English manufacturers and tradesmen similarly situated, were placed in the unpleasant dilemma of either having their firms registered (which by-the-by could not be done), or seeing the names of their firm and imitations of their labels made use of with impunity by Austrian and Hungarian manufacturers and tradesmen, being thereby exposed to incalculable loss and injury to their reputation, and deprived of all chance of exporting their manufactures into the Austro-Hungarian Empire, without having any remedy at law against the pernicious practice carried on (as has been ascertained) for years of stamping and selling articles of Austrian and Hungarian manufacture with the name and labels of established English firms, although the Austrian Trade Mark Protection Law of the 7th December 1858 makes a distinct difference between infringements of registered *trade marks*, and the unlawful appropriation and use of unregistered *names, firms, coats of arms*, and *particular titles* of business establishments of other manufacturers and tradesmen; and although Art. IX. of the Treaty of Commerce of 16th December 1865 establishes the *reciprocity* required by the Austrian law of the 15th June 1865 as a condition of entitling English manufacturers and tradesmen to the privilege of protection of their trade marks and other signs according to the Trade Mark Protection Law of 7th December 1858. Notwithstanding its first adverse decision of the 26th September 1873, the magistrate some time later granted an injunction in several instances against other Viennese tradesmen for similar offences, without making the registration of Atkinson's firm a condition of complying with their attorney's request—thus contradicting its own views on which the previous application against Treu, Nuglisch, & Co. was rejected.

The matter was, in view of these contradictions, considered serious and important enough to justify a statement of the facts of the case to His Excellency Sir Andrew Buchanan, the British Ambassador at the Imperial Austrian Court, to be submitted by him to the Foreign Office in London, with a view of obtaining, if possible, a more precise interpretation of Art. IX. of the Anglo-Austrian Treaty of Commerce for future guidance in similar cases, inasmuch as the phrase "protection in regard to the rights of property in trade marks and other signs, as well as in patterns, models, and designs for articles of industry" leaves it doubtful whether or not it includes the protection against the unauthorised use of the simple *name of the firm, coat of arms*, or particular *title* of the business establishment of an English manufacturer or tradesmen.

An attempt, however, was made to comply with the decision of the magistrate, and to bring Messrs. J. and E. Atkinson within the operation of the law by having their firm registered in the Chamber of Commerce and Manufactures at Vienna. But the Secretary of the Chamber, in accordance with long-established precedent, considered this unnecessary, and refused registration.

The opinion was then obtained of the Imperial Financial Councillor Dr. Von Rosas, Chief Commissioner of the Austrian Patent Office, and first legal adviser of the Austrian Commission for the Vienna Universal Exhibition (whose views and interpretation of the law coincided with those of the Secretary of the Chamber of Commerce), to the effect that the registration of the name of an English firm is *not* required to entitle it to protection against fraudulent use of the same and against imitation of its labels in Austria.

According to § 23 of the Trade Mark Protection Law of the 7th December 1858, and § 19 of the law relative to the protection of models and patterns of the same date, a third and last course was open to Messrs. Atkinson—a petition to the Imperial Ministries for Home Affairs and of Commerce for revision and reconsideration of the whole case.

It is satisfactory to state here that this step was crowned with success.

The Minister of Commerce, with the concurrence of the Minister of the Interior, taking into consideration the state of the law and the legal validity of the Treaty of Commerce concluded between Austria and Great Britain, not only set aside the adverse decisions of the magistrate and the "Statthalterei," but likewise laid down the principle: *that Austrian manufacturers and tradesmen have no right, by virtue of the Treaty of Commerce of the 16th December 1865, to make use of the name of the firm, &c. of any English manufacturer, although the same be not registered in Austria.*

This decision being of considerable importance to the British manufacturing and commercial community, a full and accurate translation of the Ministers' decree is appended hereto:—

"The Imperial and Royal Ministry of Commerce to the Imperial and Royal Statthalterei, Vienna (No. 41,346, Ex. '73).

"In reference to the proceedings forwarded with the report of the 15th November 1873 (No. 32,295) to the Imperial and Royal Ministry of the Interior, and transmitted by the same, with the note dated 3rd December 1873 (No. 19,112), to this Ministry, respecting the appeal of Messrs. J. & E. Atkinson, perfumery manufacturers in London, against the concurring decisions of the magistrate of Vienna of the 26th September 1873 (No. 127,746), and the Imperial and Royal Statthalterei of the 10th October 1873 (No. 29,311), by which their request to institute penal proceedings against the firm Treu, Nuglisch, & Co. in Vienna, on account of the illegal marking of their goods with the name of J. & E. Atkinson's firm, and to order the confiscation of the goods so marked, with all the materials used in the manufacture of the same, was refused, the Imperial and Royal Statthalterei is directed as follows:—

"In so far as this appeal is directed against the refusal of the request to institute penal proceedings against the firm Treu, Nuglisch, & Co., I consider this refusal, with the concurrence of the Imperial and Royal Ministry of the Interior and according to § 23 of the Trade Mark Protection Law, § 150 of the Trade Law and § 3 of the Ministerial Ordinance of the 31st January 1860 (Imperial Law Repertory, No. 31), and also from the following reason unjustified: because the firm Treu, Nuglisch, & Co., keeping in view the decisions appealed against, made use of J. & E. Atkinson's firm in marking with their name the goods which they intended for sale, on the *bonâ fide* assumption of the omission of a formal condition, namely, the presumably required registration of the name of that firm.

"In so far, however, as on the part of the appellants, the fact of an infringement of their rights in general has been complained of, and the application of § 15 (respectively § 17) of the Trade Mark Protection Law of the 7th December 1858 (Imperial Law Repertory, No. 230), demanded by them against the above-named firm, I consider myself justified in setting aside the decisions referred to of the authorities of the first and second instance, and to allow this appeal for the following reasons:—

"The Imperial Patent of the 7th December 1858 (Imperial Law Repertory, No. 230), prohibits by § 6 the arbitrary use of the *name, firm, coat of arms,* or *title* of the establishment of another inland manufacturer, and defines without at all prescribing the registration of these designations, in sect. III. of that law (and particularly in § 17), the consequences of an infringement of this prohibition.

"The law of the 15th June 1865 (Imperial Law Repertory, No. 45), indeed enacts in Art. I. that the protection granted to native manufacturers for their trade marks and other signs, by the law of the 7th December 1858, may also be extended on the condition of reciprocity to foreigneirs, provided they have, in order to be entitled to that protection, their *trade marks* and other *signs* registered in Austria.

"But the Anglo-Austrian Treaty of Commerce of 16th December 1865, which has been promulgated in No. 2 of the Imperial Law Repertory of the year 1866, with the full validity of an etablished law, stipulates in Art. IX. that the subjects of either State shall enjoy, in the dominions of the other, in respect of the right of property in their *trade marks* and other *signs, the same protection as native-born subjects.*

"As, however, the Austrian Trade Mark Protection Law does not in any case make the protection of *signs, names of firms,* and *titles* of an inland establishment conditional on the registration of the same, *Austrian manufacturers and tradesmen have*—even in case it should be assumed that the law of the 15th June 1865 implied by 'other *signs* of foreign establishments required to be registered,' also the name, firm, or business title of their establishment—*no right, according to the Treaty of Commerce of the* 16*th December* 1865, *mentioned above, to make use of the name or firm, &c. of an English manufacturer, although the same be not registered in Austria.*

"The Imperial and Royal Statthalterei is consequently hereby directed to issue the corresponding instructions, for which purpose the minutes of the proceedings submitted with the report of the 15th November 1873, referred to at the commencement, are herewith returned.

"Vienna, 13th January 1874. (Signed) BANHANS."
24521.

ANNEX A.

(Translation.)

Magistrate of the Capital and Residence Town of Vienna.

J. & E. ATKINSON,
Manufacturers of Perfumery in London, represented by the authorised partner, James Atkinson, in Vienna, Empress Elizabeth Hotel, room No. 42, request the institution of penal proceedings against the firm Treu, Nuglisch, & Co., on account of the illegal marking of their goods with the name of the firm J. & E. Atkinson, and immediate seizure of all such goods and materials.

Very urgent.

1277461/2715.
Magistrate of Vienna, presented 3rd August 1873.

DECISION.

As the plaintiffs have not proved the registration in Austria of their trade mark and firm, in accordance with the law of the 15th June 1865 (Imperial Law Repertory, No. 45), the magistrate is not in a position to comply with this request; and the bottle of scent is herewith returned.

By order of the Vienna Magistrate.
6th September 1873. (Signed) DACHAUER,
Secretary.

ANNEX B.

No. 166185. (Translation.)

From the Magistrate of the Imperial and Royal Capital and Residence Town of Vienna.

The Imperial and Royal Statthalterei of Lower Austria has by decree of the 10th October 1873 (No. 29311) given no effect to the appeal of the perfumery manufacturers, J. & E. Atkinson, of London, against the decision of the Magistrate of Vienna of the 26th September 1873 (No. 127,746), by which the request to institute legal penal proceedings, according to § 17 of the Trade Mark Protection Law, against the firm Treu, Nuglisch, & Co., in Vienna, for having made an illegal use of Atkinson's firm, and to order the confiscation of the goods kept in stock by this firm, as well as of all the materials and utensils used in their manufacture, was refused, and thereby confirmed the Magistrate's decision.

As attorney of the said firm, notice is herewith given you of this decision, and your petition of appeal (No. 127,746) is hereby returned.

The Magistrate's Director,
Vienna, 13th October 1873. (Signed) GROHMANN.
To Dr. Max Schweinburg,
Attorney for J. & E. Atkinson,
of London.

ANNEX C.

2, Wykeham Villas, Wandsworth Common,
17th January 1874.

DEAR MR. OWEN,

I HAVE this morning received from Hofrath Dr. Migerka a very important communication, which is of great interest to English manufacturers.

You will recollect that I told you at Vienna that, after having been granted in two previous instances, the application to the magistrate on behalf of Mr. Atkinson for a search warrant and an order of confiscation against the firm Treu & Nuglisch, for making a fraudulent use of the name of Mr. Atkinson's firm, was refused on the ground that their firm was not duly registered in Austria as required (so it was erroneously alleged) by the law of 15th June 1865 respecting the admission of foreigners to the privileges of protection of trade marks in Austria. Against this decision we lodged an appeal with the Statthalterei Court, which tribunal simply confirmed the magistrate's decision without stating any reasons. Against these two adverse decisions we presented a petition to the Ministries of the Interior and of Commerce, as allowed by law, and I have myself argued the point and the erroneous interpretation of Art. IX. of the Anglo-Austrian Treaty of Commerce with Drs. von Rosas and Migerka, and submitted a detailed statement of the whole case to the Minister of Commerce. I have now the great satisfaction to learn from Dr. Migerka's communication that the joint Commission of the two Ministries who have had the matter under consideration have adopted the view I have maintained from the beginning. The two Ministries have consequently set aside the two adverse decisions of both the magistrate and the Statthalterei Court and decided the case in favour of Mr. Atkinson, laying down thereby the very important principle: "*that it is not necessary for the English manufacturer to have the name of his firm* (this was the point at issue) *registered in Austria in order to be entitled to protection against any fraudulent use of the same, according to the existing laws.*" It is *only the trade marks* which require registration in order to enjoy protection provided for by the provisions of the Austrian laws. This decision also settles once for all the ambiguity of the wording of Art. IX. of the Anglo-Austrian Treaty of Commerce.

Independent of this decision I have also received from Dr. von Rosas, in his legal capacity, his interpretation of the law, which entirely agrees with the Ministerial decision.

Now that this case has been authoritatively decided, it strikes me that a complete statement of Christy's and Atkinson's proceedings should be added to the short account I propose to write regarding the provisional protection obtained for British exhibitors and the certificates granted in this respect, and the whole statement may then be appended to the report on the proceedings of the Patent Congress.

I am, with sincere respect,
Yours very obediently,
(Signed) FR. L. WEINMANN.

P. Cunliffe Owen, Esq.,
Secretary, Royal British Commission,
Vienna Exhibition, 1873.

P.S.—The following is a translation of the passage I mentioned in the letter received by Mr. Atkinson from Dr. Schweinburg at Vienna:—"I have been informed that in consequence of a presentation on the part of the English Foreign Office a strict prosecution of this affair has been urged at the Ministry of Commerce by our Minister for Foreign Affairs."

DEAR SIR, 24, Old Bond Street, 25th March 1874.

HAVING been informed by our advocate at Vienna that our appeal in the matter of the counterfeitors of our goods has been decided in our favour, and that now no legal difficulty exists to our taking immediate action against them, we with much pleasure avail ourselves of this opportunity to express to you our indebtedness for the valuable efforts you made in our behalf in this matter during your stay in Vienna last year.

The fraudulent practices of many Austrian houses were a source of so much annoyance and of so great a loss to us that it became absolutely necessary to protect ourselves, as far as possible, by appeal to the laws existing on the subject, and we feel deeply that the success we have met with in this direction is mainly to be attributed to the energetic and influential manner in which you aided our efforts.

We are sure it will be a source of gratification to you when we acknowledge the valuable services of Dr. Weinmann, the gentleman officially appointed by you to assist us in all matters of detail. The technical and legal objections made, and the difficulties thrown in our way by the Austrian officials, were innumerable, and we cannot but add that it was only by the persistent endeavours of Dr. Weinmann in bringing the question before the Chamber of Commerce and the Ministry of the Interior, that success was ultimately achieved; a success which enables us, as well as all other aggrieved English manufacturers, to proceed upon an undoubted legal basis against all fraudulent imitators in the Austrian Empire.

Begging you again to accept our sincere thanks for your valuable assistance,

We remain, dear Sir,
Yours faithfully,
(Signed) J. & E. ATKINSON.

P. Cunliffe Owen, Esq.,
Royal British Commission.

PIRACY OF TRADE MARK.

MESSRS. J. E. & W. CHRISTY & Co., of London, *v.* MALY and others.

Whilst the prosecutions instituted by Messrs. Atkinson were pending other frauds of a similar nature, but to a much larger extent, were discovered by Mr. Stephen Christy, of the firm J. E. & W. Christy & Co., hat manufacturers, 35, Gracechurch Street, London, and Stockport, also exhibitors at the Vienna Exhibition, in Group V. In almost every hat shop in nearly all the principal streets and thoroughfares of Vienna hats were exposed for sale in the shop windows having Messrs. Christy's name and trade marks stamped on the lining, and they were, of course, sold in great numbers under the pretence of being imported and of Christy's own make, and, consequently, at correspondingly high prices.

Application was made, as in Atkinson's cases, to the magistrate for search warrants, and authority for seizure, which, after the legal preliminaries, such as the depositing of a certain sum of money, in accordance with § 26 of the Trade Mark Protection Law of the 7th December 1858, as security in case of abuse and injury to the accused (in Messrs. Christy's case the sum required to be deposited as temporary security amounted to 400 fl. A. C.), &c., had been complied with, were immediately granted, and the market inspector commissioned with their execution.

Christy's cases presented less difficulties than those of Messrs. Atkinson, for although Messrs. Christy's trade marks were not registered as required by law at the time proceedings for their infringement were commenced, Messrs. Christy had availed themselves of the privilege offered to exhibitors at the Vienna Exhibition by the Austrian authorities of having their trade mark provisionally protected by obtaining from the Director-General, through the Royal British Commission, a "Schutz Certificat" (certificate of protection)* in accordance with the special law promulgated on the 13th November 1872 for the protection of the objects exhibited at the Universal Exhibition, and § 38 of the General Regulations issued on the 27th January 1872 for foreign exhibitors and Commissions. This certificate proved perfectly effective in Messrs. Christy's case, since the magistrate, on its production, at once granted the application for instituting penal proceedings against the delinquents who made an unauthorised and unlawful use of the name of their firm and of their trade marks.

On the 31st July visits were paid by Mr. Christy, accompanied by the Market Inspector of Vienna as commissioner of the magistrate, Dr. Moriz Schweinburg, managing clerk of Dr. A. Wodickh, court advocate and attorney, Mr. W. Pritchard, Messrs. Christy's assistant, and myself, to a number of establishments suspected of dealing in hats bearing Messrs. Christy's name and fraudulent fac-similes of their trade marks.

At the shop of Josef Maly, No. 13, Untere Donaustrasse, about five dozen hats of different descriptions were found and seized, the lining in each of these having an impress of an imitation of Messrs. Christy's trade marks with the name of their firm attached.

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* *See* Annex D.

At the shop of Anton Wibmer, 26, Praterstrasse, a similar number of hats, and at the establishment of Peter August Kruss, hat-maker, Münzgasse, a still larger number, were discovered and placed under seal. It having been ascertained on inquiry that the retail dealers not only in Vienna, but also in country places, and even in Hungary and elsewhere, were supplied by a large manufacturer, No. 11, Seidengasse, with hats with spurious Christy trade marks, a visit was paid to his factory, a very large establishment at which at least a couple of hundred of hands, males and females, are employed. It was astonishing to find that nearly the entire stock consisted of hats having Christy's trade marks with the name of their firm stamped on the lining, which were supplied to dealers as genuine articles of Messrs. Christy's manufacture. Mr. Messmer, the proprietor of the establishment, being absent, the managers themselves admitted that they had in stock more than a hundred dozen of such imitation hats, and that they had sold and supplied the trade with hats of that description for years, not being aware that they infringed anyone's rights by so doing, Messrs. Christy not being known to them, nor that such a firm existed in England.

The enormous extent of trade in hats with Messrs. Christy's name and trade mark made it evident that in order to check such a fraud on the public effectively for the future it was necessary to go to the root of the evil, and to obtain possession of the stamps and dies employed for printing Messrs. Christy's trade mark and name on the lining used in the trimming of hats manufactured in Vienna but sold as genuine Christy's make, for if the printers were made unable to supply hatters with linings bearing Christy's name and trade mark, dealers would no longer be in a position to defraud the public by selling such hats. It was on inquiry divulged by Messmer's managers that Mr. Messmer had dies and stamps with fac-similes of Christy's trade marks and the name of their firm specially made and linings printed wholesale with them. The names and addresses of some of such lining makers and printers having been ascertained, it was discovered that there was a number of establishments employed in this special trade. Six such establishments were visited, namely that of Joseph Würth, hat-lining maker, Mariahilferstrasse, No. 51; of Johann Wolf, maker of materials for hats, Andreasgasse, No. 11; of Wendelin Wolf, hat-lining maker, Bandgasse, No. 6; of Johann Baumann, hat-lining maker, Stumpergasse, No. 51; of Moriz Grünwald, hat-lining maker, Mariehilferstrasse, No. 30; and of Michael Dokulil, lithographer, Gumpendorferstrasse, No. 113. In all these places numbers of dies and stamps and lithographic stones with exact imitations of Christy's trade marks and the name of their firm were found and seized, with large quantities of linings printed with them, each of the respective parties pleading ignorance of having committed any wrong, since the dies were either given to them by the hat manufacturers—principally Messmer—with orders to print such quantities as they were instructed to do, or were found by them among the plant when succeeding to the business in which they were respectively engaged. In several instances it was admitted that these imitation dies of Christy's trade marks and name had been in use for the last five-and-twenty years in Vienna, without any one having ever been interfered with or told that the use of them was illegal.

The news of these seizures soon spread all over the town and caused quite a commotion among the hat-making fraternity, who thereupon held meetings to consider what steps should be taken by them under the circumstances, it being put down as a hardship to be interfered with in the legitimate pursuit of business, as no complaint had ever been made during the last twenty-five years by Messrs. Christy that the selling of hats with their name and fac-similes of their trade mark was an infringement of their right, and therefore illegal.

In due course all the parties were summoned to appear on the 8th August before the magistrate to answer for the offence with which they were respectively charged.

Mr. Christy, unwilling, like Mr. Atkinson, to deal vindictively with the accused, prevailed upon the magistrates through his attorney to forego the infliction of a fine in the case of the printers and lining makers, they having offended rather from ignorance, as instruments of the hatters, than as conscious agents.

Similar leniency was suggested to the magistrate in the matter of retail hat-sellers, who simply supplied their customers from the wholesale manufacturers, against whom the law should alone take its course.

On the 14th August the magistrate pronounced judgment acquitting the hat-lining makers Josef Würth, Johann Wolf, Wendelin Wolf, Johann Baumann, and Moriz Grünwald, and the lithographer Michael Dokulil, as regards the infliction of a fine, but prohibiting them, in accordance with § 15 of the law respecting the protection of trade marks, from further use or preparation of the label "Christy, London," enjoining them to obliterate the mark from the goods already stamped with the same and seized or still in their possession, or to cancel it, and also to destroy, in the presence of an officer of the Market Commissariat and of the plaintiff or his representative, the tools used for preparing those labels.

The hat dealers Josef Maly and Anton Wibmer were sentenced, in accordance with §§ 17 and 18 of the Trade Mark Protection Law, each respectively to pay a fine of 25 florins, Austrian currency, the hat-maker Peter August Kruss to pay a fine of 50 florins, A. C., and C. Messmer, hat manufacturers, a fine of 200 florins, Austrian currency, for the benefit of the poor-box, with the same provisions as stated above, namely, to discontinue the use of the label "Christy, London," and to obliterate that mark from the goods already stamped with it and already seized or still in their possession, or to cancel it in the presence of the Market Commissariat and the complainant, or his representative.

The publication of the sentence, which is allowed according to § 21 of the Trade Mark Protection Law at the discretion of the magistrate, and which had been applied for in the case against Messmer, was refused, inasmuch as no repetition of the offence was proved as coming under § 19 of the same law.

The hats seized at the business establishments of the different offenders were restored to them after the lining bearing Christy's imitated trade mark had been taken out and destroyed or the mark obliterated.

By § 23 of the Trade Mark Protection Law the parties were entitled to appeal against the magistrate's sentence, and the two defendants Josef Maly and C. Messmer availed themselves of this privilege. But by a decision dated the 26th December 1873 the magistrate refused this appeal for the reasons given in the judgment of the 25th August 1873, a full translation of which is appended to this report.*

Although these proceedings had the effect of checking to a very large extent the sale of hats with imitations of Messrs. Christy's trade marks and name, some dealers still persisted in exposing them for sale in their shop windows.

Proceedings were consequently instituted on the 27th October 1873 against Adalbert Pranschel, and after having complied with the usual formalities his two establishments in the Praterstrasse, No. 23, and Hauptstrasse, No. 114, were visited by order of the magistrate in company with the magistrate's commissioner. A seizure of the hats found marked with Christy's name and trade mark was made in the usual form and the hats seized put under seal.

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* *See* Annex A and B.

The defendant on appearing before the magistrate in obedience to the summons served upon him stated that he was supplied with the hats by Peter Habig, a hat manufacturer, and on their joint engagement, taken down by the magistrate, to discontinue for the future using lining with the name and trade mark of Messrs. Christy and the sale of hats provided with them, and to destroy the lining in the hats seized and in their possession, Mr. Christy through his attorney withdrew from the prosecution against these parties.*

Thus it has been proved by the proceedings instituted by Messrs. Atkinson and Messrs. Christy that the Austrian laws for the protection of trade marks, and as regards a fraudulent and unlawful use of the name or trade mark of an English firm, are perfectly effective in their application, and that Austrian manufacturers and tradesmen are not allowed to make use of them with impunity.

I have the honour to be, Sir,
Your obedient servant,
FR. WEINMANN.

P. Cunliffe Owen, Esq.,
Secretary, Royal British Commission
for the Vienna Universal Exhibition.

ANNEX A.

No. 125,558. (Translation.)

Magistrate of the Imperial and Royal Capital and Residence Town of Vienna.

In the matter of the complaint brought by the firm J. E. & W. Christy & Co., hat manufacturers in London, by Dr. A. Wodickh, against certain manufacturers and dealers in hats of this place, of infringement of their trade mark, by virtue of § 17 of the law for the protection of trade marks of 7th December 1858 (Imperial Law Repertory, No. 230), the magistrate, upon the evidence adduced, by a resolution in council of 14th August of this year opines that

Mr. Josef Würth, hat-lining maker, Mariahilferstrasse No. 51;
Mr. Johann Wolf, maker of materials for hats, Andreasgasse, No. 11;
Mr. Wendelin Wolf, hat-lining maker, Bandgasse, No. 6;
Mr. Johann Baumann, hat-lining maker, Stumpergasse, No. 51;
Mr. Moriz Grünwald, hat-lining maker, Mariahilferstrasse, No. 30;
Mr. Michael Dokulil, lithographer, Gumpendorferstrasse, No. 113,

are not punishable by fine, because an intentional infringement of the trade mark cannot be proved against them, but in accordance with § 15 of the law for the protection of trade marks, the above-named defendants are prohibited from further using or preparing the label "Christy, London," enjoined to obliterate or cancel the mark from the goods already stamped with it and already confiscated or still in their possession, also to destroy, in the presence of an officer of the Market Commissariat, to whom this matter is committed, and of the plaintiff or his representative, the tools and implements used for preparing those labels, whereupon the detainer laid upon their goods will be removed.

Mr. Josef Maly, for his wife Maria Maly, dealer in hats, Untere Donaustrasse, No. 13;
Mr. Anton Wibmer, dealer in hats, Praterstrasse, No. 26;
Mr. Peter August Kruss, hatmaker, Münzgasse; and
Mr. C. Messmer, hatmaker, Seidengasse, No. 11,

having been proved guilty on their own admission, and, in agreement with the evidence produced, that Maly and Wibmer were dealing in hats bearing the label "Christy, London," and that the illegal use of the name of the plaintiff's firm (which is known all over the world) by the hat manufacturer

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* *See* Annex C.

Messmer must have been known to them, and, further that Peter A. Kruss has been making and dealing in labels for the lining of hats with the name of the plaintiff's firm "Christy, London," in considerable quantities and for several years; also that C. Messmer keeps in his warehouse a considerable stock of hats marked with the label "Christy, London," that he has been selling them for years to other hatmakers and retailers, and gave to Josef Würth, hat-lining maker, according to the evidence of the latter, a proper engraved stamp for preparing the label complained of;—for these premeditated infractions of the law for the protection of trade marks, the two first named are sentenced, according to §§ 17 and 18 of the said law, to a fine of 25 florins each, Austrian currency; Mr. Peter August Kruss to a fine of 50 florins, Austrian currency; and Mr. C. Messmer, to a fine of 200 florins, Austrian currency, which fines are to be paid to the City Chancellor's office for the benefit of the poor-box immediately on the legal completion of these presents. And further, the above-named persons are prohibited from continuing to use the label "Christy, London," and enjoined to obliterate or cancel the mark from the goods already stamped with it and seized, or those still in their possession, and that in the presence of the Market Commissariat, to whom this matter is committed, and of the complainant or his representative, whereupon the detainer laid upon their goods will be removed.

The publication of the sentence against Messmer applied for in accordance with § 21 of the law for the protection of trade marks is not granted, because there has been no repetition of the offence proved in the sense of § 19 of the said law. An appeal against this sentence is open to the parties within 14 days of delivery of the sentence, to be made to the Imperial Royal Statthalterei. Whereof you are informed with return of the enclosed certificate of protection dated "Vienna, 11th July, 1873, Reg. No. 213," and of the power of attorney, dated 29th July 1873, with the remark, that the security of 40*l.* sterling deposited by Messrs. J. E. & W. Christy & Co. in bank drafts is detained until the sentence is legally confirmed.

For the Director of the Magistrate,
Vienna, 25th August 1873. (Signed) SPATH, m.p.

ANNEX B.

No. 204,043. (Translation.)

Magistrate of the Imperial and Royal Capital and Residence Town of Vienna.

The Imperial and Royal Statthalterei for Lower Austria has, by decree of the 11th December 1873 (No. 30,297), rejected the appeal of the hat manufacturer Josef Maly, acting on behalf of his wife, Maria Maly, and of the hat manufacturer C. Messmer, against the decision of the Vienna magistrate of the 25th August 1873 (No. 125,558), and confirmed the same from the reasons stated therein, by which the appellants were found guilty of the deliberate infringement of the rights of the firm J. E. and W. Christy and Co., by making use of their trade mark and label protected by the certificate of protection dated 11th July 1872 (No. 213), issued by virtue of the law of the 13th November 1872, Maria Maly sentenced to pay a fine of 25 florins and C. Messmer to a fine of 200 florins, Austrian currency, prohibited from further using the trade mark "Christy, London," ordered to remove the same from the goods marked therewith and seized, and respectively to destroy the same in the presence of the Market Commissariat, the seizure of their goods being at the same time cancelled.

Of which decision you are herewith informed

The Director of the Magistrate,
Vienna, 26th December 1873. (Signed) GROHMANN, m.p.
Dr. A. Wodickh.

ANNEX C.

No. 174,378. (Translation.)

Magistrate of the Imperial and Royal Capital and Residence Town of Vienna.

In accordance with the withdrawal on your part, as attorney of the firm J. E. and W. Christy and Co., hat manufacturers in London, from the prosecution against Mr. Adalbert Pranschel, in consequence of the declaration made by the same, and Mr. Peter Habig, hat manufacturers in Vienna, officially taken down in writing, for the infringement of plaintiff's trade mark, proceedings are herewith stayed in accordance with § 24 of the Trade Mark Protection Law; and the Market Commissariat is hereby directed, in reference to the commission of the 25th October, to restore to Mr. Adalbert Pranschel the hats placed under seal in his business establishments, at No. 23, Praterstrasse, and No. 114, Hauptstrasse, after the linings fixed in the same have been taken out and destroyed.

The Director of the Magistrate,
(Signed) Grohmann, m.p.

Vienna, 27th December 1873.
Dr. A. Wodickh.

Hôtel de France, Vienna,
1st August 1873.

Sir,

We herewith beg to inform you that we have availed ourselves of the provisional letter of protection granted to us 17th ultimo, which by the forethought of your Commission was extended to English trade marks. Having found that goods fraudulently stamped with our name were extensively sold in Vienna and throughout Austria, with the valuable assistance of Dr. Weinmann (who seems better learned in the laws than the Austrians themselves), whose services you so kindly placed at our disposal, we have visited several establishments of hat manufacturers, tip printers, and retailers, and in every instance found and had sealed by the commissary of police, who accompanied us, some portion of the hats, lithographic stones, and linings found on their premises bearing our name and address. We annex details of the results of our visits.

We thank you very much for the material assistance we have received from you in checking this dishonest traffic, which in many instances has thrown great discredit on our manufacture and the English trade, and we respectfully ask the favour of Dr. Weinmann's assistance in obtaining the permanent protection of our trade marks that we may endeavour to entirely put a stop to the piracy.

We remain, Sir,
Yours respectfully,
(Signed) J. E. & W. Christy & Co.

To P. Cunliffe Owen, Esq.,
Secretary, Royal British Commission,
Vienna Exhibition 1873.

Results of Visits made by J. E. & W. Christy & Co., in Vienna under the power given by magistrate's order and search warrant 31st July and 1st August 1873.

M. Maly, retailer, 14, Praterstrasse; found numerous spurious hats; sealed 66

Jos. Würth, Printer, 51, Mariahilferstrasse,—

Printed tips	178
Lithographic stones	1
Printing blocks	4

C. Messmer, Manufacturer, 11, Seidengasse,—

Spurious hats	75

Paper boxes	10
Printed tips	337

and received an undertaking from him that he would deliver to us within seven days tips of 1,200 more trimmed goods on his premises.

T. Wolf, Printer, 11, Andreasgasse,—

Printing blocks	3
Printed tips	17

W. Wolf, Printer, 6, Bandgasse,—

Printing blocks	2
Printed tips	52

M. Dokulil, Printer, 113, Gumpendorferstrasse,—

Lithographic stones	2

J. Baumann, Printer, 51, Stumpergasse,—

Printing blocks	8
Printed tips	36

P. A. Kruss, Printer, 111, Bezirk Münzgasse,—

Printed tips	756

M. Grünwald, Printer, Mariahilferstrasse,—

Printing blocks	4

A. Wibmer, Retailer, 36, Praterstrasse,—

Spurious hats	24

and in eight days he gives us a written promise to deliver all the tips on his premises stamped with our name.

We may mention that in every case we only made a partial search and sealed up only sufficient for proof of piracy.

Sir, Stockport, Feb. 11th, 1874.

We have to report to you that since our letter of the 1st August, which contained full particulars of what we had done in endeavouring to check the piracy of our name and trade mark in Austria, our Mr. Stephen Christy again visited Vienna towards the close of the Exhibition and found the piracy was still being carried on. He obtained a search warrant, and accompanied by the Market Commissioner and Dr. Weinmann of your staff went to the premises of Adalbert Pranschel, Praterstrasse, and found,—

Silk hats	1
Felt hats	4

We then went to his manufactory, Haupt strasse, and sealed,—

Silk hats	1
Felt hats	7
Printed tips	3

On condition of the printed stamps being destroyed on the 27th December 1873 the chief magistrate of the Imperial capital of Vienna released the goods which had been sealed up. We may mention that Messrs. Maly and Messmer, whose names you will find mentioned in our letter of the 1st August, appealed to the Government from the decision of the chief magistrate. The Government by a decree dated December 11th, 1873, has maintained the disputed decision of the magistrate. In bringing this matter to a satisfactory conclusion we wish to say that without the valuable assistance received from the British Commission we could not have obtained the important results that have been accomplished; we would particularly refer to the indefatigable energy of Dr. Weinmann of your staff.

We are respectfully,
(Signed) J. E. & W. Christy & Co.

P. Cunliffe Owen, Esq.,
Secretary, Royal British Commission, London.

PROTECTION of INVENTIONS, INDUSTRIAL DESIGNS, MODELS, and TRADE MARKS at the VIENNA UNIVERSAL EXHIBITION of 1873.

By section 38 of the General Regulations for foreign exhibitors and commissions issued on the 27th January 1872 by his Imperial Highness Archduke Rainer, President of the Imperial Austrian Commission, and Baron von Schwarz-Senborn, Director General of the Exhibition, intending exhibitors of foreign countries were informed that the Director-General has taken the necessary steps that the objects exhibited at Vienna should, from the time of their arrival on the exhibition grounds until their removal, enjoy the benefit of protection guaranteed by the laws in force in Austria, against piracy of inventions, trade marks, models, and designs.

In accordance with this assurance a special law was passed by both Houses of the Austrian Reichsrath which received the Imperial sanction on the 13th November 1872, and was promulgated simultaneously in the official "Wiener Zeitung" of the 28th November, and the Imperial Law Repertory of the same date (LVIII., No. 159).*

By this law it was enacted (Art. I.) that any inhabitant of the Austro-Hungarian Empire, or of a foreign country who, in the Universal Exhibition of 1873 at Vienna should exhibit any object or objects which, according to the laws of 15th August 1852 and 7th Dec. 1858, should be qualified to be protected either by letters patent or registration, could obtain for the same, on application to the Director-General, a "Certificate of Protection" (*Schutz-Certificat*).

This application had to be made any time previous to the opening of the Exhibition, or in case of the object or objects to be exhibited arriving after that date, prior to the installation in the place assigned for the same in the Exhibition.

These "Certificates of Protection" were issued free of expense, conjointly by the Director-General and an official delegate especially appointed by the Hungarian Government, and secured to every applicant, from the date of the installation of his exhibits until the 31st December 1873, the same rights and privileges which a patent obtained in the ordinary manner, or a duly effected registration for the protection of a trade mark, model, or design, would confer, but only for the period stated. A permanent protection by patent, or of a trade mark or design, had to be applied for in the regular course before the date of expiration of the provisional protection.

The Certificates of Protection granted were entered in a double register, kept for the purpose at the office of the Patent Commissioners and Chief Attorney of the Imperial Austrian Commission, one of which was intended to be deposited, at the close of the Exhibition, with copies of the respective specifications, trade marks, models, or designs, in the archives of the Royal Hungarian Ministry of Agriculture, Trade, and Commerce, and the other in those of the Imperial and Royal Austrian Ministry of Commerce at Vienna. The names of the recipients of Certificates of Protection for their specific exhibits were likewise published from time to time in the official gazettes of Austria and of Hungary.

Copies in English of this special law, and of the supplementary regulations issued by the Austrian Minister of Commerce with reference to the conditions to be complied with when application for a Certificate of Protection was made, were forwarded to every registered exhibitor of the United Kingdom; and they were likewise made public through the press, in order to allay the apprehension that new inventions, trade marks, or industrial designs exposed in the Vienna Exhibition would be insecure and unprotected, and consequently in danger of being imitated and pirated.

Notwithstanding the precautions taken by the Royal British Commission to ensure an exact compliance with the conditions issued by the Austrian Minister of Commerce, great difficulties and delays arose in obtaining the desired Certificates through the non-compliance on the part of many British exhibitors or their agents with the minister's regulations.

It was laid down as a rule that each application for a Certificate of Protection must be accompanied by two identical copies of the specification of the invention, or improvement of an invention exhibited, signed by the exhibitor, and, if necessary for explanation, by double copies of plans or drawings, or two copies of the trade mark, or specimens of the model or design, to be protected, enclosed in two separate cases or envelopes; and if the application was made by an agent or other authorized person, the letter of authorization was to be added to the application likewise.

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* *See* Annex I.

In a great many cases these conditions were only imperfectly complied with; either the applications were not, as a rule, provided with the two separate covers required by law to contain the two copies of the specification, drawings, trade marks, models, &c., or the signature of the applicant was wanting to either one or the other, or on both specifications, or the article to be protected was not distinctly enough indicated, and sometimes even the kind of protection desired, namely, whether it was to be a protection of a patent or invention, or of a trade mark, or of a model or design, was omitted; nor was, in the generality of cases, the application made, as stipulated by law, by the applicant *in person*, or by a duly authorized representative. As the Austrian authorities were exceedingly strict in regard to the exact compliance with the rules laid down in respect of the requirements to be fulfilled in applying for a Certificate of Protection, the consequence was that in the majority of cases the applications were rejected and returned for completion, and the Certificate of Protection refused. In order to obviate the inconvenience, which, in the case of foreigners, and especially English exhibitors, was considerable, and attended by great expenses, of making application for a Certificate of Protection *personally* at the offices of the Austrian Commission in Vienna, or through an agent duly authorized, the Minister of Commerce, by an order, dated the 9th March 1873,* authorized the transmission of such applications for Certificates of Protection through the Foreign Commissions represented at the Exhibition, and instructed the Director-General to receive and deal with them according to law, provided they were drawn up and supplemented in strict accordance with the provisions contained in Art. I. of the special law of the 13th November 1872, and the supplementary regulations of the 15th of the same month.

So long as all applications and enclosures having reference to Certificates of Protection were to be delivered at the Patent and Law Office of the Imperial Commission in Vienna direct, the Royal British Commission had no control over the applications made on the part of British exhibitors, nor any power as to the rectification of any errors or defects attaching to them, and had moreover, in most instances, no knowledge of the applications submitted to the general direction. So soon, however, as the British Commission was empowered to receive and transmit to the appointed authorities such applications from exhibitors in the British section, every attention was paid to their interests. With the sole exception of one instance, all applications which passed through the hands of the Royal Commission were granted, and Certificates of Protection issued in due course; and this one failure was due only to the nature of the application itself, by which protection was claimed for the design or arrangement of a group of figures contained in a lithographed outline of a photograph representing the portraits of a number of gentlemen assembled at a committee meeting. The original painting not being exhibited in the Exhibition, such a representation was considered unsuitable for protection.

The following is a list of names of British Exhibitors for whom Certificates of Protection were claimed and respectively obtained:—

ADAMS, WALTER MARSHAM, Shepherd's Bush Green, London. Group XIV. Protection of invention for a mensurator and cælometer.

AHRENS, BERNHARD, Ludgate Hill, London. Group XIV. Protection of invention for electro-magnetic billiard marker, scorer, indicator, and detector.

ASHWORTH, E., & SONS, Egerton Mills, Bolton. Group V. Protection of trade marks for sewing machine cotton, yarns, &c.

BELL, ANDREW, Huddersfield. Group XIII. Protection of invention for improved heating apparatus.

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* *See* Annex II.

Bertram, J., & Son, Leithwalk Foundry, Edinburgh. Group XIII. Protection of invention for revolving strainer for pulp for paper-making with J. & R. Wood's patent suction apparatus attached.

Blackwood, J., & Co., Bread Street Hill, London. Group XI. Protection of trade mark for all kinds of writing and marking ink.

Christy, J. E. &. W., & Co., Gracechurch Street, London. Group V. Protection of trade mark for all kinds of hats, caps, &c.

Coalbrookedale Iron Company, Coalbrookdale, Shropshire. Group VII. Protection of designs for ornamental iron gates, railings, fencings, &c.

Cooper, William Temple, Oxford Street, London. Group III. Protection of trade mark for improvements in preparing effervescing lozenges.

Davey, Paxman, & Co., Standard Ironworks, Colchester. Group XIIIa. Protection of invention for improvements in steam boilers, and improved apparatus for drying wheat, corn, and other grain, seeds, &c.

Dewhurst, John, & Sons, Bellevue Mills, Skipton. Group V. Protection of trade mark for sewing cotton.

Dewrance, J., & Co., Great Dover Street, London. Group XIII. Protection of invention for improved autographic pressure recording apparatus; Davis' patent injectors for steam and water pipes, and patent contracting pump bucket.

Dunville & Co., Belfast. Group IV. Protection of trade mark for Irish whiskey bottles.

Elmslie, Edmund W., Old Broad Street, London. Group VII. Protection of invention for apparatus for opening of hermetically closed tin cases for preserved provisions.

Evans, P. & S., & Co., Avonside Tannery, Bristol. Group VI. Protection of trade mark for leather.

Ford, Lewis, & Co., Bristol Road, Gloucester. Group IX. Protection of design for mosaic and marble enamelled slate chimney pieces.

Francis, T., & Co., Birmingham. Group VII. Protection of trade mark for nails and castings of malleable iron.

Henry, Alexander, Edinburgh. Groups VII. and XVI. Protection of invention for self-cocking breech action for fire-arms.

Kirby, Beard, & Co., Cannon Street, London. Group VII. Protection of trade mark for pin and needle wrappers, box tops, &c.

Lewin, Stephen, Poole, Dorsetshire. Group XIIIa. Protection of invention for ploughs, waggon loader and hay pitcher, combined thrashing machine and elevator, and hay, straw, wheat, &c. stacker and elevator.

Lichtscheindl, J., & Co., Upper Weymouth Street, London. Groups V. and VII. Protection of invention for patent twin spring mattress, &c.

Lloyd, Edwin, Horticultural Works, Grantham, Lincoln. Group II. Protection of invention for improved construction of horticultural structures, sashes, and frames, for the protection of flowers, fruit, and other trees and plants.

Lovière, de, C. E., & Co., Victoria Street, London. Group XIII. Protection of invention for a new mechanism for the production of circular movement and transmission of working power.

McLachlan, Lachlan, Manchester. Group XII. Protection of design of photographic group, representing the Central Executive Cotton Famine Relief Fund Committee at Manchester.

Nicoll, Donald, & Co., Paternoster Row, London. Groups III. and V. Protection of invention for improvements in uninflammable and waterproof compounds for textile fabrics, and protection of trade mark and label for waterproof cloth, coats, and cloaks, made of sanitary cloth.

Nussey & Pilling, Park Works, Leeds. Group XIII. Protection of invention for improvements in sewing machines.

Ogden, Thomas, & Co., Werneth Iron Works Mill, Oldham. Group V. Protection of trade mark for twines, yarns, cotton, &c.

Parsons, Fletcher, & Co., Southwark, London. Group III. Protection of trade mark for Indian starch.

Piesse & Lubin, New Bond Street, London. Group III. and Addit. Exhib. Protection of trade mark and label for perfumery, "Ribbon of Bruges," for sweet fumigation.

Pigall, Franz, Tichborne Street, London. Group VII. Protection of invention for scissors with flexible bows.

Platt, Brothers, & Co., Hartford Iron Works, Oldham. Group XIII. Protection of invention for improvements in combing machinery.

Ransome, Allen, & Co., Chelsea, London. Groups XIII. and XVIII. Protection of invention for improved wood-cutting machinery with pneumatic apparatus; improved morticing machines, and improved machinery for cutting mitres.

Rickards, Charles A., Bell Busk Mills, Leeds. Group V. Protection of trade mark for machine silk twists, &c.

Smith, Robert, & Co., Porter Works, Sheffield. Group VII. Protection of trade mark and label for steel adapted to various purposes.

Smith, Thomas J., Edinburgh. Group III. Protection of trade mark for liquid blue.

Smith, Wasteneys, Newcastle-on-Tyne. Group XVII. Protection of invention for patent "stockless" anchors.

Stephens, Henry C., Aldersgate Street, London. Groups III. and IX. Protection of trade marks and labels for inks, writing fluids, inkstands, &c., and wood-staining fluids.

Taylor, Brothers, Adelaide Works, Sheffield. Group VII. Protection of trade mark for circular saws.

Thorn, C., St. Giles' Gate, Norwich. Group XIII. Protection of invention for improvements in the construction of carriages or vehicles running on two wheels.

Turner, Benjamin (firm Smith & Turner), Bartholomew Close, London. Group VII. Protection of invention for patent door springs.

Turner, E. R., & F., St. Peter's Iron Works, Ipswich. Group XIIIa. Protection of invention for portable and fixed steam engines for piston slide valve for automatic governor for side frames.

Welch, Alfred, Metropolitan Cattle Market, London. Group XIII. Protection of invention for improvements in cattle trucks.

Whitley, Partners, Leeds. Group XIII. Protection of 40 different mechanical inventions, boilers, engines, various machinery, mechanical apparatus and contrivances, water filters, files, &c., and also protection of labels for mechanical productions and machinery.

Wright, Freeman, Crown Glue Works, Needham Market, Suffolk. Group III. Protection of trade mark for "crown glue," &c.

The effectiveness of the protection afforded by the certificates granted against piracy and the unauthorized and fraudulent use of trade marks of English exhibitors was proved by the proceedings instituted by Messrs. J. E. and W. Christy & Co. against a number of Austrian manufacturers and tradesmen recorded in the preceding pages.

Fr. L. Weinmann.

APPENDIX U.

AUSTRIAN PATENT LAWS.

I.—Imperial Law respecting the Protection by Patent of new Discoveries, Inventions, and Improvements, 15th August 1852.

II.—Law for the Protection of Patterns and Models for Industrial Products, 7th December 1858.

III.—Law for the Protection of Trade Marks, 7th December 1858.

SUPPLEMENT.

I.—Law of the 23rd March 1865, respecting the alteration of §§ 4 and 6 of the law of 7th December 1858 for the protection of patterns and models, &c.

II.—Law of the 15th June 1865, as to the admission of foreigners to the privileges of the Protection of Trade Marks in Austria.

III.—Instructions to be followed on the application for a patent dated 8th June 1867.

IV.—Notification of the Ministry of Commerce of November 14th, 1871, in respect of the proof to be furnished of the use of patents within the Empire.

I.

Imperial Law respecting the Protection by Patent of New Discoveries, Inventions, and Improvements, 15th August 1852.

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Form of an application for a patent.

Translated from the Imperial Law Repertory for the Austrian Empire of 1852. LVIII. No. 184.

Imperial Ordinance of 15th August 1852, valid for the whole Empire in virtue of which a new Law of Patents is promulgated in lieu of the former law of 31st March 1832,* respecting the protection by patent of new discoveries, inventions, and improvements in the department of industry.

We, Francis Joseph the First, by the Grace of God Emperor of Austria, King of Hungary and Bohemia, &c., &c.:

Actuated by the desire to have the necessary protection afforded to inventions in those Crown lands of our Empire hitherto without a patent law, and having regard to the experience gained since our Ordinance of 31st March 1832* was issued which has proved many improvements and completions of the patent laws hitherto in force to be necessary:

After conferring with our Ministers, and hearing our Imperial Council, Have decreed and determined upon the following, throughout our Empire.

Section I.

Of the Objects of an exclusive Patent.

§ 1.

An exclusive patent may be granted for each new discovery, invention, or improvement, under the limitations contained in the following §§ 2, 3, 4, and 5, which has for its object—

a. A new industrial product, *or*
b. A new means of production, *or*
c. A new method of production.

The patent may be applied for by an Austrian subject, or by a foreigner, as long as it does not pertain to those mentioned in the following paragraphs (2–5) as being unpatentable.

However, by discovery is understood every disclosure of an industrial mode of procedure, which has, certainly, been used in former times, but has since become entirely obsolete, or, generally, of one unknown in the country.

By invention is understood every representation of a new article with new means, or of a new article with means already known, or of an already known article with other than the already applied means for the same article.

Every addition of an appliance, arrangement, or mode of procedure to an already known or patented article, by means of which a more favourable result or a greater economy is to be obtained in the purpose of the article, or in the manner of its production, is regarded as an improvement or alteration.

Any discovery, invention, or improvement is considered to be new if it is neither known by means of a printed publication, nor in operation in the country up to the time of the patent being applied for.

A patent is not granted for preparations of provisions, drinks, and medicines, nor for discoveries, inventions, or improvements, the practice of which is forbidden from public motives in regard to health, morality, or security, or the general interest of the State, according to the legal ordinances.

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* In the Collection of Laws and Ordinances in the Department of Justice (I. L. G.) No. 2556, and in the Collection of Political Laws and Ordinances, Volume 60, page 42.

§ 3.

An exclusive patent can only be granted for a new discovery, invention, or improvement, which it is intended to introduce into Austrian territory from abroad, when the operation of it is likewise limited abroad by an exclusive patent.

Such grant, however, can only be made to the owner of the foreign patent, or to his legal representative or agent. Without these limitations, a patent is not allowed for an invention, discovery, or improvement made abroad, but not yet in operation at home.

§ 4.

A patent for an improvement of an already known article, or one protected by an exclusive patent, is only granted with the limitation that it extends only to the improved portion, and not to the entire article.

§ 5.

An exclusive patent is not granted for a scientific principle, or a purely scientific proposition, even where the principle or proposition is capable of immediate application to industrial objects; but every new application of such principle or proposition, by means of which a new industrial product, a new means, or a new method of production is brought about, is certainly patentable.

§ 6.

The union of two or more discoveries, inventions, or improvements differing from each other in one patent is only allowed when these discoveries, inventions, or improvements refer to one and the same article, as component parts, or operative means.

SECTION II.

Of the Conditions of securing an exclusive Patent, and of the Procedure in order to obtain it.

§ 7.

Whoever wishes to obtain an exclusive patent for a new discovery, invention, or improvement, must fulfil the conditions prescribed in this law.

These conditions are:—

(*a.*) Application to a competent authority by means of a properly drawn up petition, accompanied by the prescribed appendices:

(*b.*) Payment of a fixed tariff:

(*c.*) The fulfilment of the obligation to describe the new discovery, invention, or improvement so clearly and completely, and, if necessary to the attainment of sufficient distinctness, to illustrate it by annexing drawings or models, so that it will be possible for every professional to copy it, when it is brought under general notice after the expiry of the term of the patent.

§ 8.

Petitions for an exclusive patent can be handed in at the provincial Governments, or to the political district authorities (district offices, delegations, county authorities), where such exist.

These petitions are to be drawn up according to Formula A. They can be handed in by the applicants for patents themselves, or by a deputy. The petitions are subjected to a stamp duty of fl. 3, Austrian currency, and the supplementary documents to a duty of 15 kreutzers for each sheet. (§ 43. c. 2. of the Law of December 13, 1862.)

Every such petition must contain:—

(*a.*) The Christian and surname, business address of the applicant for a patent, and, in case he does not reside permanently in the country, the name, business, and address of a deputy residing therein. It is also necessary to give the Christian and surname, business, &c. of the applicant for a patent, if such is to be made use of by a firm differing in style from the real name of the owner of the patent. In this case the style of the selected firm is also to be stated. But it may not be the same as that of an already existing firm without their consent:

(*b.*) The name (appellation)of the discovery, invention, or improvement, and its nature:

(*c.*) The number of years for which the patent is desired. This may not exceed fifteen without our special consent, and is confined to the number of years of the foreign patent in the case of those which are already in existence abroad, and are desired to be transferred by the owners of them or their assignees to this country:

(*d.*) The statement whether the secrecy of the discovery, invention, or improvement is desired, or not.

§ 10.

With the petition for an exclusive patent must be enclosed:

(*a.*) The fee payable for the same or the certificate of its having already been deposited at an Imperial or Royal Treasury. No further payment, no matter for what, is to be made for the grant of a patent beyond this fee, even in case of a previous examination having taken place in relation to its admissibility on public grounds:

(*b.*) The valid power of authority made out in the name of the representative who hands in the petition (§ 9) for the applicant for a patent:

(*c.*) The foreign deed of patent in the original, or a certified copy, in the case of discoveries, inventions, or improvement which are intended to be introduced from abroad:

(*d.*) The specification of the article to be patented as prescribed above (§ 7 *c.*), sealed, and under cover, upon which is to be written the discovery, invention, or improvement to be patented agreeing in substance with the statement in the petition, and giving the address of the applicant for a patent, or his representative.

§ 11.

The charge for the patent is estimated according to its duration, and is of the same amount, whether the patent for a discovery, invention, or improvement be applied for by a native or a foreigner. It amounts to 100 guldens for the first five years of the patent, to 200 guldens for the following five years, and to 400 guldens for the last five years, fl. 20 of which are to be paid each year separately during the first five years; consequently, for the five years together Fl. 100

for the sixth	year	-	„ 30
„ seventh	„	-	„ 35
„ eighth	„	-	„ 40
„ ninth	„	-	„ 45
„ tenth	„	-	„ 50
„ eleventh	„	-	„ 60
„ twelfth	„	-	„ 70
„ thirteenth	„	-	„ 80
„ fourteenth	„	-	„ 90
„ fifteenth	„	-	„ 100
Together		-	Fl. 700

for the fifteen years, being the longest period during which the patent is allowable.

The above charges are now to be defrayed in Austrian currency, 5 per cent. being added to the sums above indicated. Imperial ordinance of July 8, 1858, in the Imp. Law Gazette, No. 102.

The tariff thus payable must be deposited all at once for the entire number of years for which the patent is applied for, or it must be shown that the deposit has been made, otherwise the petition will be laid aside at once, without any official treatment of it.

A return of the deposited fee after granting the petition subject to it can only take place when the patent is annulled on public grounds after granting it, and, moreover, only in proportion to the unexpired duration of the patent.

§ 12.

The specification (§ 10), which is regarded as *an essential condition* to obtaining an exclusive patent, must coincide with the following requirements:—

(*a*.) It must be drawn up in the German or official language of the Crown land where the petition is handed in, and must be signed by the applicant for a patent, or his representative mentioned in the petition.

(*b*.) It must contain the detailed representation of the discovery, invention, or improvement stated in effect in the petition.

(*c*.) It must be so drawn up that every professional would be able to manufacture the article in accordance therewith, without having recourse to new inventions, additions, or improvements.

(*d*.) That which is new, and consequently the article to be patented, must be distinctly shown in the specification, or be accurately distinguished.

(*e*.) The discovery, invention, or improvement must be shown clearly and distinctly, without ambiguities which could mislead, and which are contrary to the object stated under (*c*).

(*f*.) Nothing may be concealed, either as to the means or the mode of execution, therefore neither more expensive means, nor means not producing quite the same effect, nor handles which are necessary for the success of an operation, may be suppressed.

(*g*.) If drawings, samples, or models are necessary for the intelligibility of the specification, these must be enclosed, executed in a durable colour. They may, besides, be added at the pleasure of the applicant for a patent, in so far as the distinctness of the specification drawn up in accordance with the requirements expressed in (*c*) may be increased thereby. At present the annexed documents must be deposited in two identical copies.

§ 13.

The authorities to whom is handed the petition for a patent are to examine the same in the presence of the depositor as to whether—

(*a*.) The petition is properly drawn up and signed.

(*b*.) The necessary enclosures are appended.

(*c*.) The prescribed tariff is enclosed, or proof furnished of its having been deposited.

If the authorities find that the petition is in order in these respects, they note on the cover containing the specification the day and hour of its presentation, and the deposited amount of tariff, signing it jointly with the applicant for the patent, or with his representative. They then give the depositor a receipt (certificate) for the application received, which contains, besides, the name and address of the applicant for the patent, as well as of his eventual representative, the day and hour of the deposit, the acknowledgment of the tariff deposit paid, and the discovery, invention, or improvement stated in effect in the petition.

The priority of the announced discovery, invention, or improvement is established from this day and hour, *i.e.*, every objection raised against a similar discovery, invention, or improvement made or worked hereafter is regarded as invalid, and cannot negative nor neutralise the novelty of a discovery, invention, or improvement described and announced by the applicant for a patent in conformity with the regulations.

If, on examination of the petition, a defect or other fault becomes apparent, it will be simply returned to the applicant for rectification or erasion of the fault denoted without taking official cognizance of it.

§ 14.

The petition for a patent, together with all vouchers received for official treatment, are forwarded by the authorities in each Crown land with whom the deposit has been made to the provincial Government without delay, and within three days at latest, unless it is lodged at the provincial Government itself.

§ 15.

The provincial Government examines every such petition in the following respects:—

(*a.*) Whether the object of the petition may not, perhaps, be absolutely unsuitable for the grant of a patent.

(*b.*) Whether the enclosures conform with the prescribed conditions, namely, whether the article to be patented described on the cover tallies with the statement made in the petition, and whether it is properly signed.

If the provincial Government deems the object of the petition absolutely unsuitable for the grant of a patent, in accordance with §§ 2–6, they inform the petitioner of the fact, and request him to take back the sealed specification handed in with the petition against a receipt, as well as to receive the deposited fees, or else appeal to the Ministry of Trade and Commerce within the term appointed in trade matters, viz., six weeks (§ 146 of the Law for Trade and Industry of December 20, 1859).

If it appears that the appendices to the petition do not conform with the prescribed conditions, or that the object of the patent as stated on the cover of the sealed specification does not tally with the contents of the petition, the provincial Government invites the applicant to rectify the same within a suitable space of time, retaining the petition meanwhile. If this space of time is exceeded the petition is returned.

All petitions drawn up in proper form and not deemed absolutely unsuitable for the grant of a patent, as well as those which receive the rectifications alluded to within the allotted space of time, are submitted by the provincial Government with the sealed specifications, and all other vouchers to the Ministry of Trade and Commerce.

§ 16.

The Ministry of Trade and Commerce is appointed to re-examine all the requirements prescribed for the petition for a patent. It is, however, its exclusive right to open the sealed specification and examine it in the following respects:—

(*a.*) Whether the specification is drawn up in a language mentioned as allowable (§ 12), and whether it is properly signed.

(*b.*) Whether the object for which a patent is sought is not divisible into two or more articles differing from one another, and requiring a division.

(*c.*) Whether the statement in the petition, on the cover of the enclosed specification and in the specification itself of the object of the patent agree; further, whether the specification is characterised by that clearness and perspecuity which § 12 requires; more especially, whether the drawings, patterns, or models necessary to its distinctness are to hand, and whether all purely formal requirements of the same have been observed.

(*d.*) Whether the article to be patented, as stated in effect in the petition and on the cover of the specification, is in contravention to the existing laws and ordinances, either in sanitary or other public respects, and therefore not at all adapted for the grant of a patent, or only under certain conditions or limitations. Moreover, care is to be taken that the strict secrecy which the subject demands be observed, and all means for insuring against a possible breach of it adopted.

§ 17.

An examination, no matter of what nature, into the novelty or the usefulness of the discovery, invention, or improvement stated, can in no case take place before the patent is granted, for which, however, the State administration do by no means hold themselves responsible; on the contrary, the patent is granted in this respect solely at the risk, expense, and costs of the patentee.

§ 18.

In all those cases where no hindrance presents itself, after estimation and examination in accordance with § 16, the grant of the patent by the Minister of Trade and Commerce is made by drawing up a special deed, but, in other cases, a petition unadapted for such grant of patent is rejected, the reason being given, and an order issued that the deposited patent fees be refunded. But if objections are apparent which can be removed, the rejection only takes place after the applicant has failed to remove them within the suitable space of time granted him for so doing.

§ 19.

The grant of a patent in no wise relieves the patentee from the legal ordinances and regulations which exist, or are issued, for the benefit of the public health, security, or morality, or in the interest of the State. Consequently, the use of such patent is subject to all such ordinances and regulations conformably to which it may only take place in a restricted form, or not at all, according as it is restricted or altogether forbidden by them, unless the patent can be made to prove an exception thereto.

§ 20.

The enclosed specifications appertaining to the patents, together with the Appendices (§ 16) are handed over to the Central Archives for Patents for custody and further use, as to which Section V. of this law contains further directions.

SECTION III.

Of the Advantages and Powers appertaining to Exclusive Patents.

§ 21.

An exclusive patent secures to, and protects the patentee in, the sole use of his discovery, invention, or improvement as set forth in the specification he has submitted, for the number of years for which his patent is made out.

§ 22.

The patentee is entitled to erect all those workshops, and to engage all kinds of assistants for them necessary to the complete use of his patented article to the greatest extent desired; therefore he can erect everywhere throughout the empire establishments and depôts for the manufacture and sale of the patented article, and authorise others to carry out his discovery, invention, or improvement under the protection of his patent; he can admit any partners he likes, and increase the use of the patented article to any extent, dispose of his patent himself, entail it, sell it, farm it out, or otherwise dispose of it at his pleasure, and also take out a patent for the same article abroad.

These rights are, however, strictly confined to the precise object of the patented discovery, invention, or improvement, and may not, therefore, be extended to cognate objects, nor be exercised in contravention to the existing laws or other prerogatives.

§ 23.

If the patent refers to an improvement or alteration of a patented article, it remains exclusively confined to the individual improvement or alteration itself, and does not give the patentee of the improvement, or alteration any right to the remaining portions of an already patented article, or already known mode of procedure. Whereas, on the other hand, the patentee to whose patented article the patented improvement or alteration made by another has reference, has no right to use the latter, unless he comes to some agreement with the other concerning it.

SECTION IV.

Of the Extent and Duration of Exclusive Patents, and of the Publication of same.

§ 24.

The legal validity of each patent extends to the entire Austrian empire.

§ 25.

The longest duration of patents is fixed at fifteen years. We reserve to Ourselves the concession of a further period, which is only to be applied for to Us by the authorities in cases specially worthy of consideration.

§ 26.

Every exclusive patent takes effect from the day of issue.

The publication of the granted patent has, however, to take place in the manner, and at the time of its coming into operation, as set forth by the laws in general.

§ 27.

Every patentee whose patent is granted for a shorter period than the maximum time allowed for the same (§ *9 c*) can claim the extension of it for one or several years within the longest duration appointed, if he takes steps for that purpose before its expiry (§ 22–2, *a. b*). In order to obtain this, the petition for the extension is to be handed in betimes with the patent deed appended, and the full tariff for the extension of time desired (§ 11), or the certificate of its having already been deposited at an Imperial or Royal Treasury enclosed.

The extension is granted by the Ministry of Trade and Commerce, and is officially confirmed on the patent deed itself.

§ 28.

Every patent granted or extended by the Ministry of Trade and Commerce, every transfer of a patent, as well as the fact of its having become void, will be published as prescribed in § 26.

§ 29.

Patents become void—

1. By annulment (rescision, suspension, or sentence).

(*a*.) Annulment can take place if it be found that the legal requirements for a sole patent do not exist, more especially:

aa. If it appears that the specification of the patent is defective, and more especially, is not provided with the requirements stated in § 12, *c–f*, and is therefore insufficient.

bb. If any one legally proves that the patented discovery, invention, and improvement did not possess the quality of novelty in the country, according as prescribed in § 1, even before the day and hour of issue of the official certificate; or that the patented discovery, invention, or improvement was introduced from abroad, and the inland patent thereof not granted to the owner of the previously obtained foreign patent for the same article, or to his legal assignee (§ 3).

cc. If the owner of a patent in force shows that the discovery, invention, or improvement patented at a later period is identical with his own discovery, invention, or improvement previously announced and patented in conformity with the rules.

b. If an obligation which the validity of the patent requires is not fulfilled.

c. If it is objectionable on public grounds (§ 19).

2. By expiry. This occurs—

a. When the patentee has not commenced to make use of his discovery, invention, or improvement at home within one year from the day of issue of the deed of patent, at latest; or if he has entirely discontinued the use of it at home for two entire years. Further;

b. When the original or subsequently prolonged duration of the patent has ceased.

c. When the patent is voluntarily laid aside.

It is, of course, understood that these means by which a patent may become void, or expire, apply to every one who subsequently acquires a patent, as well as to the original patentee.

§ 30.

As soon as a patent has become void the use of the discovery, invention, or improvement in question is allowed generally, subject to the observance of the existing trade laws and other ordinances thereto referring.

SECTION V.

Of the Registration of Patents and the Custody of the Specifications.

§ 31.

Every patent, as soon as granted, is entered in a register at the Ministry of Trade and Commerce.

If the patent is used in the style of a firm, differing from the real name of the owner of the patent, the name of the firm will also be registered.

The specifications, drawings, models, &c. belonging to the patent will be preserved in a separate archive at the Ministry of Commerce. Every alteration occurring in the existence of a patent is noted in the above register.

§ 32.

Every one is allowed to obtain verbal or written information about patents granted at the Office of Patents, and even personally inspect the register for this purpose. In like manner every one may look at the descriptions, together with appendices in custody there, the secrecy of which was not applied for, or which relate to patents no longer valid. Finally, he can take copies, or have copies taken from the register, at his own expense, of certain portions of such patents, or of those specifications not kept secret. At the same time, however, express attention is directed to those regulations contained in this law concerning infringements of patents (§ 44).

§ 33.

The Patent Office submits to the Ministry for Trade and Commerce, at the end of each month, a statement of the alterations occurring during this period in the condition of the patents in consequence of new grants, extensions, changes of ownership, and expiry of their duration. One copy of each statement is sent to the provincial authorities and to the Chambers of Commerce and Trade in all the Crown lands, for the purpose of making an index to the register for granting information in such matters, on application being made in proper form.

At the end of each year a similar annual statement is published.

§ 34.

The specifications of the patents whose validity has ceased are put in print annually, and published according as may be deemed suitable.

SECTION VI.

Of the Transfer of Patents.

§ 35.

Every exclusive patent obtained can be legally transferred to heirs, in part or entirely, in case of death, through trustees or assigns.

§ 36.

Every deed of transfer must be enclosed and submitted to the Ministry of Trade and Commerce, either direct, or by the Governor of the Crown land in which the transfer is made, or where the petitioner resides.

If not issued by a public jurisdiction it must be legalised in proper form.

Should the proof of transfer be found faulty by the provincial Government, or by the Ministry, it is to be returned for rectification.

But if satisfactory proofs of the transfer are given, the Ministry are to have it entered in the appointed register, the entry confirmed in writing on the deed of patent, and in the case of an only partial transfer, a special certificate issued besides concerning it.

§ 37.

The registered transfers of patent are to be made public without delay. After this has taken place, no one can excuse himself by pleading ignorance of the transfer having been effected.

SECTION VII.

Of the Infringements of Patents and the Litigation resulting therefrom.

§ 38.

It is regarded as an infringement of, or encroachment upon, a patent—

(*a.*) If any one copies or counterfeits the patented article in the way shown in the enclosed specification without the consent of the patentee, even in cases where the copy or counterfeit should be made on the basis of an entirely or partially identical patent which has, however, been granted him at a later period.

(*b.*) If anyone introduces or obtains from abroad, without the consent of the patentee, imitations or counterfeits of an inland patent for the purpose of sale in trade, or of the custody or exhibition of it for such sale; or, finally,

(*c.*) If any one undertakes the sale, or even only the custody or exhibition of such articles for sale, without the consent of the patentee.

§ 39.

If the specification of a patent has been registered the first infringement constitutes an infringement of the law; if, however, the specification has been kept secret every repetition of the infringement is, at the request of the aggrieved party, to be punished by a fine of fl. 25–1,000 in addition to the forfeiture (confiscation) of the imitations or counterfeits. In case of the insolvency of the delinquent, he is to be sentenced to one day's arrest for every five guldens, in lieu of the fine.

With regard to the implements and appliances exclusively serviceable for the execution of an imitation or counterfeit, they are to be taken to pieces, altered, or rendered useless, according to their nature, provided no other arrangement is arrived at about them, as between the aggrieved party and the delinquent.

The fine goes to the poor-box of the place where the infringement was committed. The forfeited articles are to be destroyed, unless an arrangement is made between the condemned and the patentee for their remittal on account of the compensation awarded to the latter.

If the delinquent has made use of the knowledge of the discovery, invention, or improvement he has obtained in the service or by the confidence of the patentee, for the purpose of infringement, this is to be taken into consideration in passing sentence as an especially aggravating circumstance.

§ 40.

If the aggrieved party does not wish to prosecute, or if it is merely a question of the first infringement of a patent, the specification of which is kept secret, the aggrieved party is only entitled to insist upon the discontinuance of further imitations or counterfeits, and the sale thereof, and to demand security that the trespasser's imitations or counterfeits, in case they are produced in the country, are neither used nor sold, nor again introduced abroad, in case they should have been imported thence for sale during the time the patent is in force.

§ 41.

In all disputes the discovery, invention, or improvement is only to be judged of in conformity with the specification appended to the petition for a patent. This specification, therefore, must in all cases serve as a basis for giving a decision where this depends on the contents of it, regardless of its being kept secret; and in so doing no subsequent alterations or representation of the patented article, no matter of what nature, may be taken into account.

§ 42.

The Ministry of Trade and Commerce alone gives opinion on the question as to whether a granted patent is to be regarded as invalid or extinct (§ 29) on any legal grounds. It therefore specially decides on the question of the novelty of a patented discovery, invention, or improvement; as to whether it was only introduced from abroad, and was not suitable for a patent; and, finally, in disputes between two patentees about the question of the complete or partial identity of their patents.

§ 43.

The examination into and punishment of the infringements specified in §§ 38 and 39 is the duty of the political jurisdictions in whose district they have been committed, in accordance with the existing regulations for the procedure in cases of trade encroachments, unless other regulations are hereafter issued.

Everyone is at liberty in such cases to appeal to the higher authorities against the enactments and judgments of the political district jurisdiction, if he imagines himself aggrieved thereby, and if an alteration of the first decision is decreed in consequence of this step he can further appeal to the Ministry of Trade. However, this appeal must be deposited in either case within 14 days at latest from the day of delivery of the decision which is appealed against.

If a sentence of punishment is appealed against, its execution is stayed pending the final decision. If, during the examination, it appears that the decision depends on a previous question, upon which only the civil courts can decide, the political authorities refer the parties to the competent civil courts, and they (the political authorities) can only arrive at their own decision in such a case after the legal verdict of the civil court has been submitted to them. Moreover, the valid decision of the political authorities, in virtue of which anyone has been found guilty of an infringement of the law of patents and sentenced to a punishment, serves the aggrieved party as a basis whereon to establish his claims to compensation before the civil judge.

§ 44.

The political authorities can appoint an inspection or scientific report to be made if sufficient reasons exist, and if by this or any other means the fact of a punishable infringement is authentically proved, they can direct the immediate confiscation or other suitable custody of the imitations of counterfeits of the patented article, and of all implements and appliances exclusively serviceable for producing them.

However, in so doing, care is always to be taken that no irreparable damage is inflicted upon the accused unless urgently necessary, and therefore, in case of need, the deposit of a suitable security by the aggrieved party for libel and damage is required.

§ 45.

If, during the examination, it appears that the decision depends on previous questions which rest with the Ministry of Trade and Commerce (§ 42), this decision is to be officially demanded, and the proceedings of the penal authorities stayed pending its receipt.

The confiscation which may already have been ordered, or the other provisional dispositions which may have been made, can, however, be maintained till the decision as to the continuance of the proceedings has been arrived at.

§ 46.

Provided it is not a question of the infliction of a punishment for infringement of a patent, but only of the discontinuance of such infringement as mentioned in § 40, or if it is only a matter of decision as to the ownership of a patent, whether the dispute be about the priority of the discovery, invention, or improvement, or a matter of private right of the aggrieved party which has been referred by the criminal tribunals to the civil courts, these latter will examine into and decide upon them, and moreover, in those Crown lands in which the summary procedure in such matters is introduced, in accordance with the existing regulations for such cases.

§ 47.

If the existence of an infringement is authenticated, or is proved in consequence of an inspection or scientific report having been made, the civil judge can likewise appoint, at the request of the aggrieved party, the immediate confiscation or other suitable custody of the imitations or counterfeits of the patented article (§ 40) with due regard to the case prescribed in § 44, either unconditionally or against deposit of a suitable security for libel and damage.

Every such measure must, however, be justified by means of a complaint within eight days, in accordance with the provisions of the rules of court, as is the case with a prohibition; otherwise it would have to be set aside at once on application by the opponent, and due satisfaction given for libel and damage.

§ 48.

If the decision of a complaint within the competence of the civil judge depends on previous questions as to which the judgment of the Ministry of Trade and Commerce is given, it is incumbent on the parties to obtain this judgment, and produce it in the course of the litigation.

§ 49.

Encroachments on the trade rights of third parties which the owner of a patent commits in the use thereof by exceeding the limits of his rights therein established, are to be punished by those authorities appointed to determine in infringements of trade regulations in accordonce with the special provisions existing in such cases. The circumstance of his having misused the patent for a trade encroachment is at the same time to be regarded as a specially aggravating circumstance.

§ 50.

To what extent the party who unlawfully lays claim to the originality of the discovery, invention, or improvement of another in order to obtain a patent for it himself or by means of third parties, consequently becomes guilty of a fraud or other punishable act, is decided in conformity with the laws relating to punishment.

SECTION VIII.

Special Regulations in relation to Sole Patents granted before the present Law came into operation, and still valid.

§ 51.

In order to secure to the proprietors of patents still valid and issued on the basis of the ordinance of 31st March 1832, the advantage of a more extended operation of them, similar to those issued in accordance with the present law, they are granted the privilege of establishing their patent rights in those Crown lands of the empire as well, in which the patent law of 31st March 1832 was not introduced, with the coming into operation of the present law; however, this extension of the patent to Crown lands, in which the ordinance of 31st March 1832 was not introduced, cannot be prejudicial to those parties, who have already really made use there of the patented discovery, invention, or improvement before the publication of this extension.

§ 52.

The actual attainment on the part of the proprietor of a patent issued according to the law of the year 1832 of the extended limits of it cannot, however, take place before he has sufficiently established his ownership of it at the highest political jurisdiction of the Crown land in which he desires to enter upon the enjoyment of the patent rights, nor before the official publication of the patent has been made by the authorities there.

§ 53.

The extension of the limits of a patent is declared free of every additional payment of fees.

§ 54.

All petitions for the extension of a patent issued in accordance with the law of 31st March 1832 are subject to the provisions of the present one, as soon as it has come into operation.

§ 55.

The infringements of and encroachments on a patent committed before the present law has come into operation are to be treated in those Crown lands in which the patent law of 31st March 1832 was in force, according to the provisions of it.

§ 56.

Immediately after it has come into operation, the present law is at once available generally, subject to the limitations for all matters described in the preceding paragraphs which arise out of previously granted patents, whether they relate to their use, duration, transfer, validity, or suspension, in the stead of the patent law of 31st March 1832, hitherto in force.

The registrations of patents granted or extended before the present law comes into operation remain, however, unaffected thereby.

Given at Our Capital and Residence of Vienna, on the 15th August in the year 1852, being the fourth of Our reign.

(Signed) Francis Joseph.
(Countersigned) Count Buol-Schauenstein.
A. Baumgartner.

By order of His Imperial and Royal Apostolic Majesty.
(Signed) Ransonnet.

PRIVILEGIUMS-GESUCH.

Löbliche oder Hochlöbliche.

(Hier ist die politische Kreis-, Comitats-, Delegations-behörde oder Statthalterei, an die man sich wendet, zu nennen.)

Ich (Wir) N. N. (Vor- und Zuname, Charakter, Wohnort des oder der Privilegienwerber) zeige (zeigen) hiermit geziemend an, eine neue Entdeckung (Erfindung, Verbesserung) gemacht zu haben, welche in der Wesenheit darin besteht, dass (hier hat die Darstellung derselben zu folgen).

Die genaue, nach der Vorschrift des § 12 des Allerhöchsten Patentes vom . . . . . abgefasste Beschreibung wird in der Nebenlage beigeschlossen.

(Wenn der Privilegiumswerber die Geheimhaltung der Beschreibung wünscht, so hat er diess beizusetzen, und wenn Zeichnungen, Modelle, Muster, u. s. w. zugleich beigebracht werden, ist dieses mit genauer Angabe der Anzahl der Stücke anzusetzen.)

Auf diese angezeigte und vorschriftmässig beschriebene Entdeckung (Erfindung, Verbesserung), welche ich (wir) unterzeichneter (unterzeichnete) Privilegiumswerber nach bestem Wissen und Gewissen für privilegirbar und neu nach den Bestimmungen des gedachten Allerhöchsten Patentes, und folglich auf meine (unsere) Gefahr und Verantwortung zur Erlangung eines ausschliessenden Privilegiums gesetzmässig geeignet halte (halten), suche ich (suchen wir) hiermit um ein solches Privilegium auf die angezeigte Entdeckung (Erfindung, Verbesserung) in der Art wie sie in der beigeschlossenen, versiegeltene Beschreibung dargestellt ist, unter den gesetzmässigen Clauseln und Bedingungen auf . . . . Jahr, an, zu welchem Ende die nach § 11 des gedachten Allerhöchsten Patentes entfallende Privilegiumstaxe mit . . . Gulden Conventions-Münze vollständig von mir (uns) entrichtet und um die Ausfertigung des ämtlichen Certificates, zur Sicherung meiner (unserer) Prioritäts-Ansprüche gebeten wird.

(Ort, Jahr und Tag der Ausfertigung.)

(Unterschrift (ten).)

[*Translation.*]

FORM of a PETITION for the GRANT of a PATENT.

Worshipful, or Most Worshipful

(*The name of the political district, county, or delegational authority, or provincial Government, to whom application is made, is to be stated here.*)

I (*we*), N. N. (*Christian and Surname, business and residence of the applicant or applicants for the patent*) herewith announce in due form, that I (*we*) have made a new discovery (*invention, improvement*), which in effect consists of (*The representation of it has to follow here*).

The accurate specification thereof drawn up in accordance with the provision contained in § 12 of the Imperial ordinance of August 15, 1852, is enclosed herewith.

(*If the applicant for a petition desires the specification to be kept secret, he must state this, and if drawings, models, patterns, &c. are appended at same time, the number of them must be accurately given.*)

This discovery (*invention, improvement*), announced and described in due form, which I (*we*), the undersigned applicant (*applicants*) for a patent deem to be lawfully suitable to such, and to be new according to the provisions of the Imperial ordinance aforesaid to the best of my (*our*) knowledge, and consequently at my (*our*) own risk, and on my (*our*) own responsibility deem to be lawfully suitable for the obtainment of a sole patent, I (*we*) therefore apply herewith for such patent for the discovery (*invention, improvement*) announced, in the manner shown in the enclosed sealed specification, subject to the legal conditions and stipulations for years, for which purpose the tariff for the grant of a patent, payable in accordance with § 11 of the aforesaid Imperial ordinance, is hereby declared to be entirely paid by me (*us*) in the sum of florins, and the issue of an official certificate in order to secure the priority of my (*our*) claims is therefore requested.

(*Place, and date of application.*)

(*Signature*(*s*)).

II.

PROTECTION OF PATTERNS AND MODELS.

INDEX.

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Translated from the Imperial Law Repertory, for the Austrian Empire of 1858, *LVIII., No.* 237.

IMPERIAL ORDINANCE of 7th December 1858, valid for the whole Empire, promulgating a Law for the Protection of Patterns and Models for Industrial Products.

We, Francis Joseph I., by the Grace of God, Emperor of Austria, King of Hungary and Bohemia, &c., &c.:

In order adequately to protect native industry as regards new patterns and models applied in its productions, and thus to promote its development, We have, after consulting Our ministers and the deliberations of Our Reichsrath, promulgated the following law, and decree that the same shall come in force in the whole Empire on the 1st March 1859.

Our Minister of Commerce, Trade, and Public Works, and as regards the military frontier, Our Commander-in-Chief of the Army, are charged with the execution of this law.

Given at Our Capital and Residence of Vienna, the 7th December, 1858, being the 11th year of Our reign.

(Seal.)

(Signed) FRANCIS JOSEPH.
(Countersigned) COUNT BUOL-SCHAUENSTEIN.
CHEVALIER VON TOGGENBURG.
COUNT GRÜNNE, Field Marshal Lieutenant and Adjutant-General.

By Imperial Order.
(Signed) MARHERR.

LAW.

FOR THE PROTECTION OF PATTERNS AND MODELS FOR INDUSTRIAL PRODUCTS.

I.—*General Provisions.*

§ 1.

By patterns and models is understood in this law every pattern referring to the shape of an industrial product suitable for application to such.

What is said in the following about patterns applies with equal force to models.

§ 2.

Whoever has originally designed a pattern, either himself or by means of another person for his own account, is exclusively entitled to the use of it for industrial products for the time, and subject to the stipulations, enacted in this law.

He can also transfer this right, either entirely or in part, to others.

He can never acquire the exclusive right (§ 10 *d*) decreed in this law of patterns which any one has unlawfully secured for himself, whether it be at home or abroad.

§ 3.

An exclusive right to patterns which only consist in imitations of independent works of art is not recognized.

§ 4.

The exclusive right of use lasts for three years from the date of the registration of the pattern, and without distinction of it.

II.—*Deposit of the Patterns.*

§ 5.

Whoever wishes to secure for himself the exclusive right to the use of a pattern must deposit it at the office of the Chamber of Commerce and Trade in whose district he lives, or in which his establishment about to use the pattern is situate, before he introduces a product made in accordance with it.

The applicant is at liberty to hand in the pattern open, or in a sealed cover.

The functionary of the Chamber of Commerce, whose duty it is, enters the pattern or packet in the registrar of patterns under its current number.

A record is made of the deposit, which has to contain the name or the firm, and residence of the depositor, the day and hour of deposit, and the register number referring to it, and it must also be signed by the applicant.

The open pattern or sealed packet deposited is properly connected with the record by means of a tape fastened with a seal, and the number of the register is written on it, and officially signed.

The record is kept in the archives, and an official certificate, containing the same particulars, made out for the applicant.

If the applicant has handed in the pattern open and in duplicate, the above particulars are to be noted on the duplicate itself, and officially signed, and this is to be delivered to the applicant in lieu of the above-mentioned certificate.

§ 6.

The registration fee is ten guldens for each pattern. This is paid into the treasury of the Chamber of Commerce.

§ 7.

Several patterns may be handed in under one cover; but in this case their number must be indicated upon it, and the fee paid for each separate pattern.

Every incorrect statement on the cover affecting this rate will be charged to the depositor in the threefold amount of the evaded fee.

§ 8.

The applicant in whose name a pattern has been registered (the depositor) is considered the real proprietor of it, until the contrary is proved.

§ 9.

The party entitled to protection must use the pattern for industrial products at home, and introduce the latter to trade within one year after the deposit has been made. During this time the patterns deposited under sealed cover will be kept in this condition. At the end of the first year the seals will be removed in the presence of two witnesses, a record made, and the inspection of the patterns allowed to every one, as was already the case at first with respect to those deposited open.

III.—*Invalidity of the Registration, Loss of the Pattern Right.*

§ 10.

The registration of a deposited pattern is void and without effect, if one of the following facts are proved:—

(*a.*) That industrial products made according to the deposited patterns were already in the trade, at home and abroad, before the date of the deposit:
(*b.*) That the pattern has previously appeared in a printed publication:
(*c.*) That it has been previously registered at home in the name of another person:
(*d.*) That the depositor has unlawfully obtained the pattern (§ 2).

§ 11.

The right to the exclusive use of a pattern becomes extinct—

(*a.*) If the depositor does not use the protected pattern in the Austrian empire within one year after its deposit:
(*b.*) If the depositor introduces into the Austrian empire goods made abroad according to the pattern.

IV.—*Encroachments, Infringements, and Penalties.*

§ 12.

Every infringement on the pattern right, be it by illegitimate transfer or imitation of a protected pattern, or by the sale of goods manufactured according thereto, establishes the right of the aggrieved party to insist on the stoppage of the further use of the pattern, and the further sale of the goods in question. He can also demand that the implements and means exclusively or especially serviceable for producing an imitation be rendered useless for this purpose. Claims of the aggrieved party to compensation for damage sustained by the infringement of his pattern right are to be estimated according to the Civil Law.

§ 13.

An imitation does not necessarily cease to be prohibited, because only the dimensions or the colours of the pattern have been changed.

§ 14.

If the infringement has been knowingly perpetrated, a fine of fl. 25–500 is to be inflicted on the delinquent in addition to the punishment that may apply in such cases as provided against by the Penal Code.

§ 15.

In case of a renewal of the offence, the punishment may be doubled. In case of a recent renewal of the offence, the punishment of a week to three months' arrest will be inflicted on the delinquent in addition to the fine.

If the infringement of the pattern right has been committed by a workman or *employé* of the aggrieved party, or otherwise by a breach of his confidence, this is to be taken into account in determining the punishment as a specially aggravating circumstance.

§ 16.

If the fine should prove seriously detrimental to the circumstances, or pursuit of means of subsistence of the delinquent or his relations, or should prevent his payment of the compensation arising out of the criminal act, it is to be altered to one day's arrest for each five guldens.

§ 17.

The magistrate can also decree that the judgment be published.

§ 18.

The fines go to the poor-box of the place where the offence was committed.

V.—*Jurisdiction and Procedure.*

§ 19.

The trial and decision as to infringements of the pattern right, if they prove to be such in accordance with § 15, as well as the examination into and punishment of them, is the duty of the Political Administrative Jurisdictions of First Instance, in accordance with the existing regulations for the procedure and successive appeal in the case of trade encroachments and infringements.

The Political Jurisdiction also decides as to the invalidity of the deposit or loss of pattern right.

The decision with regard to the claims for compensation mentioned in § 12, and disputes regarding the ownership of a pattern, is given by the Civil Judge.

§ 20.

Should it occur in the course of the examination or inquiry that the result depends on a previous question upon which the Civil Courts have to decide, the Political Jurisdiction refer the parties to the competent tribunal, and can only give their own decision in such a case after legal sentence of the Civil Courts have been handed in.

Moreover, the legal sentence of the Political Jurisdiction, by which anyone has been found guilty of infringement of the pattern right, serves the aggrieved party to establish his claims for compensation before the Civil Judge.

§ 21.

A trial for punishment on account of the infringements specified in this law can only be instituted on the application of the aggrieved party, unless a criminal act has been committed, which is to be proceeded against *ex officio* according to the Penal Code, by the Criminal Courts.

But if he withdraws his application for punishment of the accused before the announcement of the authoritative decision, all punishment, as well as all further inquiry with that object in view, will be put an end to, without prejudice to his claims to compensation at Civil Law.

§ 22.

As often as it is a question of comparing two patterns in order to prove an infringement, the authorities are to obtain a report from unprejudiced experts. When drawing up a report, the parties to the dispute are to be present and their explanations and possible objections heard. A report can only be contested on account of doubts as against the experts, or on account of informalities.

If it is defective or vague, its rectification may be insisted upon.

Review of it is not allowed.

§ 23.

In all disputes, the Political Jurisdiction, as well as the Court, is entitled to demand the transmission of the deposited pattern by the Chamber of Commerce and Trade against a receipt. In case of its being necessary to open the cover of the pattern the depositor is to be summoned.

If he does not appear, two unprejudiced witnesses are to be present. A record is to be taken of the seals having been removed.

§ 24.

The aggrieved party is entitled to demand, even before the decision of his plaint, the confiscation or other custody of the products denoted by him as being manufactured by an infringement of his pattern right, as well as the implements and appliances used for that purpose (§ 12). The Political Authorities are to order this to take effect immediately after production of the official certificate or duplicate issued in accordance with § 5. It is, however, left to their discretion to demand beforehand security for abuse and injury to the accused. At the same time as the order is issued for confiscation or other custody, the authorities are to direct the pattern deposited with the Chamber of Commerce and Trade to be sent in, in accordance with § 23.

§ 25.

If it is found that an infringement of the pattern right has taken place, the articles in question are to remain under official seal till the expiration of the term of protection, and arrangements are to be made for the care of same at the expense and risk of the delinquent, provided some other arrangement is not made between the parties concerned, or the suitable alteration of it effected under official supervision.

§ 26.

If the accused is proved innocent, and the plaint to have been made maliciously, the authorities may sentence the plaintiff to a fine not exceeding 300 florins, which goes to the local poor-box, without prejudice to the claim of the accuser to compensation.

III.

PROTECTION OF TRADE MARKS.

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Translated from the Austrian Imperial Law Repertory of 1858, *LVII.* *No.* 230.

Imperial Ordinance of 7th December 1858, valid for the whole Empire, promulgating a Law for the Protection of Trade Marks and other Signs.

We, Francis Joseph I., by the Grace of God Emperor of Austria, King of Hungary and Bohemia, &c., &c.

After conferring with Our Ministers and hearing Our imperial council with a view to enact and institute the following law for the protection of trade marks and other signs:

Hereby decree, that the same shall take effect throughout Our empire on and after the 1st January 1859, in order to protect both the trading classes and the public generally from the disadvantages which accrue to them from the abuse of trade marks and other signs.

Our Minister for Commerce, Trade, and Public Works, and in so far as regards the military frontier, Our Commander-in-Chief of the Army, are entrusted with the execution of this law.

Given at Our Capital and Residence of Vienna, the 7th day of December, in the year 1858, being the 11th of Our reign.

(Seal.)

(Signed) FRANCIS JOSEPH.
(Countersigned) COUNT BUOL-SCHAUENSTEIN.
CHEVALIER VON TOGGENBURG.
COUNT GRÜNNE, Field-Marshal Lieutenant, and Adjutant-General.

By Imperial Order.
(Signed) MARHERR.

LAW.

FOR THE PROTECTION OF TRADE MARKS AND OTHER SIGNS.

I.—*General Provisions.*

§ 1.

By marks are understood in this law the special tokens which serve to distinguish between the products and goods of one manufacturer and those of another, destined for commerce (devices, ciphers, vignettes, and such like).

§ 2.

If a manufacturer wishes to secure for himself the exclusive right to the use of a mark, he must have the same registered in accordance with the provisions of the following section.

§ 3,

No exclusive right can be obtained for marks which consist of such tokens as are generally in use in the case of certain descriptions of goods in commercial intercourse, nor for those which merely consist of letters, words, or figures, nor for state or local armorial bearings.

§ 4.

The exclusive right to a trade mark only precludes the use of it by other manufacturers in respect to those descriptions of goods, to which belong the products or trade articles of commercial intercourse for which the protected trade mark is intended.

§ 5.

The mark belongs to the trade enterprise for which it is intended becomes extinct with it, and changes proprietorship with it.

In the latter case, however, the new proprietor must have the mark transferred to his name within three months, otherwise the right to the mark becomes extinct unless the trade is continued by the widow or a minor heir of the trade-proprietor or for account of the heirs or bankrupt's estate.

§ 6.

No one may arbitrarily appropriate the name, firm, arms, or the style of an establishment of another inland manufacturer or producer, in order to mark goods or products.

§ 7.

All that is said in this law with regard to the marking of goods, applies as well to the marks on the packages, receptacles, coverings, &c.

§ 8.

By the present law nothing is altered in the existing regulations, more especially in those relating to chasing, with regard to special marks decreed for certain goods.

II.—*Registration of the Marks.*

§ 9.

The Mark for which a manufacturer wishes to secure the exclusive right of use (§ 2), must be handed in in duplicate to the Chamber of Commerce or Trade in whose district the trade enterprise which intends making use of it is situate; one copy will be incorporated in the register of marks to be kept by the Chamber of Commerce or Trade, the other will be returned to the applicant with the receipt described in the following paragraph.

§ 10.

On each of the two copies the functionary appointed by the Chamber of Commerce and Trade has to note—

(*a.*) The current number of the register;
(*b.*) Day and hour of presentation;
(*c.*) The name in which the mark is registered;
(*d.*) Particulars of the trade enterprise for which it is intended;
sign this note and furnish it with the official seal.

§ 11.

The resignation fee is five guldens, which is paid in to the treasury o the Chamber of Commerce.

§ 12.

The exclusive right to the use of a mark on the part of the depositor begins on the day and at the hour of presenting the mark at the Chamber of Commerce and Trade, and the priority of claim will be judged of accordingly, should the same mark have been deposited by several manufacturers at the same or at different Chambers of Commerce and Trade.

§ 13.

In order to transfer the right to a mark, in accordance with the tenor of § 5, the applicant must furnish proof of the acquisition of the same on the part of trade enterprise in question.

The transfer is subject to the same fee as the prior registration.

§ 14.

The registers of marks are to be open to every one's inspection at the Chambers of Commerce and Trade.

III.—*Encroachments, Infringements, and Penalties.*

§ 15.

Every infringement of the right to a mark, be it by the illegal appropriation or counterfeit of the same, or by the sale of goods unlawfully marked in such wise, establishes the right of the aggrieved party to insist upon the stoppage of the further use of the illegal mark, and the removal of the same from goods marked therewith, in so far as they are intended for sale. He can also demand that the implements and contrivances, exclusively or especially serviceable for producing counterfeits of the marks, shall be rendered useless.

Claims of the aggrieved party to compensation for damage sustained by the infringement of his right to the mark are to be estimated in accordance with the Civil Law.

§ 16.

A counterfeit exists when the marks in question are not to be distinguished without more than ordinary attention.

§ 17.

The provisions contained in § 15 *apply* in *like manner* to those persons—

(*a*.) Who fraudulently appropriate the name, firm, arms, or special style of the establishment of another inland manufacturer or producer in order to mark goods intended for sale.

(*b*.) Who introduce products or trade articles, which are furnished with an unlawful mark of this kind.

§ 18.

If the infringement (§§ 15 and 17) has been knowingly perpetrated, a fine of fl. 25–500 is to be inflicted on the delinquent besides the punishment that may apply in such cases as are provided against by the Criminal Code.

§ 19.

In case of a renewal of the offence, the punishment may be doubled.

In case of a recent renewal of the offence, the punishment of a week to three months' arrest will be inflicted on the delinquent, in addition to the fine.

§ 20.

If the fine should prove seriously detrimental to the circumstances or pursuit of means of subsistence of the delinquent or his relations, or should prevent his payment of the compensation arising out of the culpable act, it is to be altered to one day's arrest for each five guldens.

§ 21.

The magistrate can also decree that the judgment be published.

§ 22.

The fines go to the poor-box of the place where the offence was committed.

IV.—*Jurisdiction and Procedure.*

§ 23.

The trial and decision as to infringements (§§ 15 and 17), as well as the examination into and punishment of them, as denoted in §§ 18 and 19, is the duty of the Political Administrative Jurisdictions of First Instance, in accordance with the existing regulations for the procedure and successive appeal in the case of trade encroachments and infringements.

The Political Jurisdiction also decides the disputes which arise about the right to the mark, its priority and transfer, and the question as to the identity of several marks.

But as regards the claims for compensation mentioned in § 15, the decision is given by the Civil Judge.

§ 24.

A trial for punishment on account of the infringements specified in this law can only be instituted on the application of the injured party, unless a culpable act has been committed which is to be proceeded against *ex officio*, according to the Penal Code, by the Criminal Courts.

But if he withdraws his application for punishment of the accused before the announcement of the authoritative decision, all punishment as well as all further inquiry with that object in view will be put an end to, without prejudice to his claims to compensation, at Civil Law.

§ 25.

As often as it is a question of comparing two marks in order to prove an infringement, the authorities are to obtain a report from unprejudiced experts.

When drawing up a report, the parties to the dispute are to be present, and their explanations and possible objections to be heard.

A report can only be contested on account of doubts as against the experts, or on account of informalities. If it is defective or vague, its rectification may be insisted upon.

Review of it is not allowed.

§ 26.

The aggrieved party is entitled to demand, even before the decision of his plaint, the confiscation or other custody of the goods and implements used for counterfeiting, mentioned as being in contravention of this law.

The Political Jurisdiction are to order this to take effect immediately after production of the sample of the mark issued and authenticated in accordance with § 10.

It is, however, left to their discretion, to demand a temporary security for abuse and injury to the accused.

V.—*Temporary Provisions.*

§ 27.

Those manufacturers also, who already use a mark, can acquire the exclusive right to use it only according to the provisions of this law.

§ 28.

To this end they are allowed till the end of the month of June 1859, with the effect that, by the registration of the mark within this term anyone's right remains secured of establishing the priority of the mark used before the publication of this law against any one else who may have been beforehand with him in registering the same mark, but has not really used it previously.

§ 29.

But if several have used the same mark prior to the coming into operation of this law, that one amongst those who have had it registered within the term appointed in § 28 acquires the exclusive right to it who proves that he has used it before the others.

The Political Jurisdiction are to decide a dispute about it on the basis of the proofs furnished to them concerning the prior commencement of the use of the mark hitherto, after hearing the contending parties.

In this the contents of the registers of marks (sign-rolls, &c.) are determinative in those parts of the country where they were already kept under public authentication before the promulgation of this law, provided no scruples exist.

But if none of the disputants can adduce proof of a longer use than the others of such mark, it will be decided by lot.

§ 30.

A claim to priority cannot be established with respect to marks which are only handed in for registration after the 30th June 1859, from the fact of their having been used before the publication of this law.

SUPPLEMENT TO THE AUSTRIAN PATENT LAWS.

I.

Law of the 23rd March 1865 respecting the alteration of §§ 4 and 6 of the Law of 7th December 1858 for the Protection of Patterns and Models for Industrial Products.

(Imperial Law Repertory, XI. No. 35.)

With the assent of both Houses of the Reichsrath, I decree as follows :—

ART. I.

§§ 4 and 6 of the Law of the 7th December 1858 (Imperial Law Repertory, No. 137) for the protection of patterns and models for industrial products are hereby abrogated.

ART. II.

The following §§ are substituted in their place :—

§ 4.

"The exclusive right for using a pattern is to last only three years at most from the date of registration of the pattern. It is optional to the applicant to choose within specified time the number of years for which he requires protection.

"The time once applied for and granted will not be extended.

6.

"A fee has to be paid for each registration of a pattern, which fee is to be paid to the Treasury of the Chamber of Commerce.

"This tax amounts to fifty kreuzer, Austrian currency (one shilling), for each year for which the protection of the pattern has been granted."

ART. III.

The Ministries of Commerce and Agriculture are charged with the execution of the law.

(Signed) FRANCIS JOSEPH.
ARCHDUKE RAINER.

For the Imperial and Royal Ministry for Commerce
and Agriculture,
BARON VON KALCHBERG.

Schönbrunn,
23rd May 1865.

By Imperial order,
BARON VON RANSONNET.

SUPPLEMENT TO THE AUSTRIAN PATENT LAWS.

II.

Law of the 15th June 1865, valid for the whole Empire, respecting the admission of Foreigners to the privileges of protection of Trade Marks in Austria.

(Imperial Law Repertory, XV. No. 45.)

With the assent of both Houses of the Reichsrath, I decree as follows:—

ART. I.

The provisions of the law of the 7th December 1858 (Imperial Law Repertory, No. 230), for the protection of trade marks and other signs may be extended to the trade marks and signs of tradesmen of foreign countries under the condition of reciprocity. The tradesmen of the respective States, in order to be granted the privilege of protection of their trade marks and other signs, must have them registered with a Chamber of Commerce and Trade of the Empire, and in all other respects observe the provisions of the Law of the 7th December 1858.

ART. II.

The Ministry of Commerce and Agriculture is charged, with the concurrence of the Ministry of Foreign Affairs, with the execution of this law.

(Signed) FRANCIS JOSEPH.
ARCHDUKE RAINER.
ALEXANDER COUNT MENSDORFF-POUILLY,
Field-Marshal Lieutenant.

For the Imperial and Royal Ministry of Commerce,
(Signed) KALCHBERG.

Vienna,
15th June 1865.

By Imperial order,
(Signed) CHEVALIER VON SCHWIDER.

SUPPLEMENT TO THE AUSTRIAN PATENT LAWS.

III.

INSTRUCTIONS TO BE FOLLOWED ON APPLICATION FOR A PATENT.

Owing to the altered conditions of public law, and on the basis of the agreement arrived at between the Royal Hungarian and the Imperial and Royal Ministries for Agriculture and Commerce, relative to the treatment of matters having reference to patents for inventions, sanctioned by His Imperial and Royal Apostolic Majesty by decree of June 5th of the present year (1867), the Ministry for Agriculture and Commerce herewith bring the following rules under general notice:—

1. Every patentee has henceforth to furnish *two similar copies of the specification of the patent as well as of the drawings and patterns thereunto pertaining* of which one copy will be kept in the Patent Archives of the Royal Hungarian Ministry for Agriculture, Industry, and Commerce, and the other in the Central Patent Archives of the Imperial and Royal Ministry for Agriculture and Commerce.

In cases where, on account of the incompleteness of the original specification, the production of supplementary specifications is indispensable, these, together with the drawings and patterns, must also be presented in two similar copies of each.

2. The patents will be granted as heretofore, to be valid for the whole extent of the empire, but **EVERY PATENTEE WILL HENCEFORTH RECEIVE TWO PATENTS**, one from the Royal Hungarian Ministry of Agriculture, Industry, and Commerce, which will be valid for the kingdom of Hungary and Transylvania, the other from the Imperial and Royal Ministry of Agriculture and Commerce, which will be valid for the other Crown lands.

3. The concession for extension or transfer of patents granted prior to the 10th March 1867, will be confirmed on the record of the patent by both Ministries.

The confirmation of such concessions as refer to patents granted after the 10th of March 1867, will be made by the respective Ministries on the two patents mentioned in sect. 2; accordingly both documents must in each case be annexed to applications for the extension or transfer of patents.

The duty on patents remains unaltered.

The Imperial and Royal Ministry for
Vienna, 8th June 1867. Agriculture and Commerce.

SUPPLEMENT TO THE AUSTRIAN PATENT LAWS.

IV.

NOTIFICATION of the **IMPERIAL** and **ROYAL MINISTRY** of **COMMERCE**, dated November the 14th, 1871, and published in the Vienna Gazette of the 22nd of November 1871, in respect of the proof to be furnished of the use of Patents within the Empire.

In order to prevent the abuse of Austrian patents which foreigners often commit by not exercising their privilege within the Austro-Hungarian monarchy, as provided by the Laws on Patents, and merely introducing into the Austro-Hungarian States patented articles produced abroad, a certain time is allowed to the foreign applicant for patents to exercise his privilege within the empire and to furnish the necessary proofs thereon, at the expiration of which time, if he has not done so, the patent, in accordance with § 29, *2a.* of the Patent Law of August the 15th, 1852, will be declared void on account of its not having been used.

As it, however, frequently occurs that these periods are entirely ignored by the owners of the patents or their authorised representatives, it is herewith decreed for general information that in future in all cases where neither the proof is furnished within the period appointed that the patent was worked at the proper time within the empire, nor a sufficiently established application for extension of time handed in, the notification that the patent in question has become void on account of its not having been availed of will at once be issued with the concurrence of the Royal Hungarian Ministry for Agriculture, Industry, and Commerce, in conformity with § 29, *2a.* of the Patent Law of 15th August 1852, and without giving any further notice respecting it.

The same steps will be taken, although the proofs of the timely use of the patent may have been given within the delay specified, should it transpire from the inquiries made that the article of the patent in question has not been produced within the Austro-Hungarian monarchy, but has only been imported from abroad.

The Imperial Royal Ministry
Vienna, 14th November 1871. of Commerce.

Translated by Dr. Weinmann.)

APPENDIX W.

TREATY OF COMMERCE.

I.—Introductory Remarks.

So far back as the year 1851 Austria first abandoned a prohibitory and adopted a protective system of customs duties. Under this system raw products, especially those of agriculture, were admitted at low rates of duty, whilst manufactured goods and works of art were more highly taxed.

With some few exceptions the export duties levied at that time were insignificant.

On the 19th February, 1853, Austria concluded a treaty of commerce with the Zollverein, by which treaty mutual concessions were made in the customs tariffs of the respective countries.

The revised tariffs, as concluded by the treaty for the term of 12 years, came into operation on the 1st January 1854.

On the 16th December 1865, Austria concluded a treaty of commerce with the United Kingdom, which treaty remains in force until the 1st January 1877. Under this treaty British subjects and trade are placed upon the footing of the most favoured nation, and share in all the privileges which are granted to the subjects or trade of any third power.

The reductions accorded to France by continental states have been generally extended to the United Kingdom, either under treaties containing the "most favoured nation" clause, or by direct tariff negotiations, as in the case of Austria.

The Austrian treaty further provides that the rate of import duty to be levied upon the produce or manufactures of the United Kingdom shall not, on and after the 1st January 1870, exceed 20 per cent. of their value at the place of production, with the addition of the cost of transport, insurance, and commission as far as the Austrian frontier.

There are very few *ad valorem* duties in the Austrian tariff :the duties are chiefly levied by weight. As regards imports the duties are sometimes imposed on the gross and sometimes on the net weights. The export duties, which are charged on a very few articles—namely, on raw hides and skins, rags and materials for paper making, and bones and refuse of hoofs, &c.—are levied on the gross weight.

Transit duties have been entirely abolished.

Trade and commerce are entirely free in Austria, foreigners being admitted to the unrestricted exercise of manufacturing or commercial industry upon obtaining the consent of the Minister of Commerce.

II.—Treaty of Commerce concluded between Austria and Great Britain, 16th December 1865.

(*This Treaty is in force until the* 1*st January* 1877.)

Article I.

During the continuance of the present treaty the subjects and commerce of Austria shall enjoy within all the dominions and possessions of Her Britannic Majesty, including Her Majesty's colonies and foreign possessions, the same advantages which have been conceded to French subjects and commerce by the treaty between Her Majesty and the Emperor of the French, signed at Paris on the 23rd of January 1860, and to the subjects and commerce of the States of the Zollverein by the treaty between Her Britannic Majesty and His Majesty the King of Prussia, representing the sovereign States and territories united to the Prussian system of customs and contributions, signed at Berlin on the 30th of May 1865; and further, Austrian subjects and commerce shall be placed in all other respects on the footing of the subjects and commerce of the most favoured nation.

ARTICLE II.

From and after the 1st of January 1867, British subjects and commerce shall, within the dominions of His Imperial and Royal Majesty, be placed in every respect upon the footing of the most favoured nation, and share in all the advantages and privileges which are enjoyed by the commerce and subjects of any third power.

From this rule are excepted:—

(*a.*) Such advantages as those which for the sole purpose of facilitating frontier traffic are at present conceded or may hereafter be conceded to the States of the German Zollverein, or to other neighbouring States; and also those reductions of or exemptions from customs duties which are valid only at certain parts of the frontier, or for the inhabitants of particular localities.

(*b.*) Such advantages as belong or may hereafter be conceded to the subjects of the German Confederation in virtue of Federal treaties and Federal laws.

(*c.*) Such special and ancient privileges as are enjoyed by Turkish subjects as such, for Turkish commerce in Austria.

ARTICLE III.

The Austrian customs tariff (the present system of calculating customs duties by weight being maintained) shall be so regulated that the duty to be levied upon articles, the produce or manufacture of the dominions of Her Britannic Majesty, upon their importation into the Austrian States, shall, from the 1st January 1867, not exceed 25 per cent. of the value, with the addition of the cost of transport, insurance, and commission necessary for the importation into Austria as far as the Austria customs frontier, and for this purpose there shall serve as basis the average value of the articles included under one and the same denomination in each position of the future Austrian tariff.

From and after the 1st January 1870, the maximum of these duties shall not exceed 20 per cent. of the value, with the additions above defined.

Articles constituting State monopolies—namely, tobacco, salt, and gunpowder,—and further, goods comprised in Classes I. and VII. of the present Austrian tariff, are excepted from these maxima.

ARTICLE IV.

Commissioners from both Governments shall meet, not later than the month of March 1866, for the purpose of ascertaining and determining the values and the additional charges, and they shall take as the basis of their calculations the average prices at the principal centres of production and commerce of the United Kingdom for the year 1865.

Three years after the duties fixed by treaty shall have come into operation each of the contracting parties shall have a right to claim a revision of the values.

ARTICLE V.

Such duties of the future Austrian tariff as will come into operation the 1st of January 1867, and to which England attaches a special interest, shall form the subject of a supplementary convention to be concluded between the two contracting parties.

All articles constituting State monopolies, as also all goods subject to fiscal duties included in Classes I. and VII. of the present tariff, remain also here excepted.

Article VI.

Internal imposts which are levied in the territory of one party on the production, preparation, or use of any article, whether on account of the State or on account of municipalities and corporations, shall under no pretext affect the productions of the other party in a higher or more onerous degree than the same productions of native origin.

Article VII.

The contracting parties agree that every reduction in their tariffs of import or export duties, and every privilege, favour, or immunity which either contracting party may hereafter grant to the subjects and commerce of a third power, shall be extended immediately and unconditionally to the other contracting party, with a reserve however of the exceptions enumerated in Article II. *a* and *b*.

Article VIII.

The subjects of one of the contracting parties shall enjoy in the dominions and possessions of the other equality of treatment with native subjects in regard to charges on loading and unloading, to warehousing, and to the transit trade, as also in regard to bounties, facilities, and drawbacks.

Article IX.

The subjects of one of the two high contracting parties shall, in the dominions of the other, enjoy the same protection as native subjects in regard to the rights of property in trade marks and other distinctive marks, as well as in patterns and designs for manufactures.

Article X.

The high contracting parties reserve to themselves to determine hereafter, by a special convention, the means of reciprocally protecting copyright in works of literature and the fine arts within their respective dominions.

Article XI.

The present treaty shall remain in force for the space of 10 years, to date from the 1st of January 1867, and in case neither of the high contracting powers shall have notified to the other, 12 months before the expiration of the said period of 10 years, its intention of putting an end to its operation, the treaty shall continue in force for another year, and so on from year to year, until the expiration of a year, counting from the day on which one or other of the high contracting parties shall have announced its intention to put an end to it.

The high contracting parties reserve to themselves the right to introduce by common consent into this treaty any modification which is not opposed to its spirit and principles, and the utility of which shall have been shown by experience.

Final Protocol.

Upon proceeding to the signature of the Treaty of Commerce concluded this day between Austria and Great Britain, the plenipotentiaries of the two powers made the following declaration:—

I.

The plenipotentiaries of His Majesty the Emperor of Austria declared that, in virtue of Article XIII. of the Treaty of Customs' and Contributions' Union of the 23rd of December 1863, between Austria and Lichtenstein, the Treaty of Commerce concluded this day would apply equally to the Principality of Lichtenstein, and the British plenipotentiary accepted this declaration.

II.

In order to avoid any future doubt as to the intention of Article III., the plenipotentiaries of the two powers have agreed to the following explanation :—

In the construction of a tariff of specific duties by weight within fixed *ad valorem* rates, it is necessary to determine what shall be the unit of value to which each specific duty shall be applied.

In adopting the basis of value established by Article III., it is understood that it is not intended to depart from the general principle of the Article, viz., the application of certain maximum *ad valorem* rates of duty to all articles of British produce and manufacture, but to guard against the necessity of making separate provision for every variety of each article, thereby creating minute and inconvenient subdivisions in the tariff.

With this view it becomes necessary to group together qualities and descriptions of the same article or of similar articles, which from their approximation in value and general resemblance in character, it is found possible to include under one and the same denomination in one position of the tariff.

But it is understood that in fixing the denominations in each position of the future Austrian tariff, they shall be so arranged that the duty affixed to any one position shall not exceed the "maximum" rates fixed by Article III. of the treaty upon the average value of any kind of goods of commercial importance included under any one denomination in such position, unless by common consent it is considered expedient or necessary.

III.

With reference to Article IV., the plenipotentiaries likewise agreed that if it shall be found that the prices of any description of goods have been essentially disturbed by exceptional causes during the twelve months of the year 1865, the commissioners of the two Governments shall endeavour to find such a basis of value for such goods as shall be considered a fair average value for future years.

In the matter of textile manufactures (the prices of which have been seriously deranged during the late war in the United States of America), it is agreed that if the average prices of the year 1865 be taken as a basis of value, either contracting party may claim a revision of such valuation after the 1st January 1868.

IV.

The British plenipotentiary then declared that—

Her Britannic Majesty engages to recommend to Parliament the abolition of the duties payable on the importation of wood and timber into the United Kingdom, and also the reduction of the duties payable on wine in bottle to the amount of those payable on wine in wood, upon importation into the United Kingdom.

V.

The Austrian plenipotentiaries in their part declared that—

The duty upon the export of rags from the states and possessions of His Imperial and Royal Majesty shall, from and after the 1st July 1866, be reduced to 2 florins the zoll-centner; and

The duty upon the importation of salt herrings into the states and possessions of His Imperial and Royal Majesty shall, from the 1st February 1866, be reduced to 50 kreutzers the zoll-centner gross weight.

(*Translated by Dr. Weinmann.*)

APPENDIX X.

PROTECTION OF INDUSTRIAL DESIGNS AND INVENTIONS—RULES, &c.

(a.)

SPECIAL LAW.

FOR THE PROTECTION OF OBJECTS EXHIBITED AT THE UNIVERSAL EXHIBITION IN VIENNA IN 1873.

Sanctioned by His Imperial and Royal Apostolic Majesty, on the 13th November 1872, and promulgated in the Official "Wiener Zeitung" of the 28th November 1872, No. 273, and in the "Official Repertory "of the Laws of the Austrian Empire" of the same date, LVIII., No. 159.

With the concurrence of both Houses of the Reichsrath I hereby declare as follows:—

ARTICLE I.

Any inhabitant of the Austro-Hungarian empire or of foreign countries who, in the Universal Exhibition of 1873 at Vienna, will exhibit any object or objects, which, according to the provisions of the Law of August 15, 1852 (Official Law Repertory of 1852, No. 184), and the two Laws of December 7, 1858 (O. L. R. of 1858, Nos. 230 and 237), may be qualified to be granted a patent or protection of trade mark or design, can obtain for the same, from the Director-General of the Universal Exhibition a "Certificate of Protection" (*Schutz-Certificat*).

An application to that effect must be addressed to the Director General at the latest at some date previous to the opening of the Exhibition, or in case the object should, with the permission of the Director General, have been introduced later, prior to its installation in the Exhibition, and must be accompanied by an exact specification of the same, *signed by the Exhibitor*, and (so far as is required for explanation) by double copies of plans or drawings, or two specimens of the trade mark,* design, or model, as the case may be, enclosed in two separate cases or envelopes.

If the application be made through an agent or other authorised person, the letter of authorisation must be added to the application likewise.

ARTICLE II.

The "Certificate of Protection" will be issued, free of expense, by the Director General of the Universal Exhibition, with the co-operation and countersignature of an official appointed for that purpose by the Hungarian Ministry, and will secure to the applicant, from the date stated therein of the installation of the respective objects into the Exhibition—or if the application should have been made after that date, from the day of making the application (which is also to be stated in the Certificate of Protection)—until the 31st December 1873 inclusive, the same rights and privileges which a patent, obtained in the regular course, or a duly obtained registration for the protection of a trade mark, design, or model, would grant him. The exhibitor is reserved the right to apply to the appointed authorities, before the day of expiration of the "Certificate of Protection," for a patent, or the protection of the trade mark, design, or model for the same object or objects, according to the provisions of the laws mentioned in Article I.

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* In the case of the protection of a trade mark it should also be stated on what sort of goods the mark is to be placed.

ARTICLE III.

No appeal or complaint will be admitted against the refusal of such "Certificate of Protection."

In case the legality of any "Certificate of Protection" should be disputed, the decision will rest, according to the laws on patents, with the competent authorities.

ARTICLE IV.

A double register will be kept by the Director General of the Universal Exhibition for entering the applications for "Certificates of Protection" and the certificates issued, of which, after the close of the Exhibition, one with the aforesaid applications and a copy of the specifications attached to them, as also of the trade marks, designs, and models, will be lodged with the Imperial and Royal Ministry of Commerce; and the other, with copies of the applications and their appendices, with the Royal Hungarian Ministry for Agriculture, Industry, and Commerce.

ARTICLE V.

The "Certificates of Protection" issued will be published in the Austrian and Hungarian "Official Gazettes."

The inspection of the register of "Certificates of Protection" is open to every one, but the specifications, plans, models, &c. will be kept secret, if it be so desired in the application.

ARTICLE VI.

The Minister of Commerce is charged with the execution of this Law.

(Signed) FRANZ JOSEPH, m.p.
(Countersigned) AUERSPERG, m.p. BANHANS m.p.
Gödöllö, 13th November 1872.

PROTECTION OF INDUSTRIAL DESIGNS AND INVENTIONS.

(b.)

SPECIAL REGULATIONS ISSUED by the IMPERIAL AUSTRIAN MINISTER OF COMMERCE for the EXECUTION of the LAW of 13th November 1872, concerning the PROVISIONAL PROTECTION of the OBJECTS EXHIBITED at the UNIVERSAL EXHIBITION in VIENNA, 1873.—Published in the Imperial Law Gazette of November 28, 1872. LVIII. No. 160.

ARTICLE I.

Before any application for a "Certificate of Protection" to be issued by the Chief Manager of the Universal Exhibition is officially dealt with, an examination must take place *in the presence of the applicant,* whether the application is provided with the supplementary documents prescribed by law, viz., two identical copies of the Specification of the respective objects, or two identical copies of the respective trade mark, pattern, or model, under two distinct covers, on which the object and name of the applicant is to be noted, and if the application is made through an agent, a power of attorney for the latter must be added likewise.

If there is found any deficiency, the application will, without being officially dealt with, be returned to the petitioner in order to have it completed; however, the reason of the return must be notified to the applicant. On the applications being found regular with regard to the above-mentioned requirements, and which are in consequence officially to be dealt with, the day and hour of their presentation must be written conspicuously on the outside of the cover.

It is understood that by a Certificate of Protection there can be acquired in every instance only *one* kind of legal protection, viz., either protection by a patent, or of a trade mark, pattern, or model, according to the respective objects being qualified for one or the other kind of protection.

The decision, whether such qualification exist in the object, is to be taken according to the provisions of the several Patent and Protection Laws referred to in Article I. of the Law of 13th November 1872, concerning the protection by patent according to paragraphs 1, 2, and 5 of the Law of 15th August 1852 (Repertory of Laws of the Empire, No. 184), and the protection of trade marks, patterns, and models, according to sections 1 and 3 of the two Laws of 7th December 1858 (Repertory of Laws of the Empire, Nos. 230 and 237).

The object, therefore, for which a certificate is solicited must be examined in this sense, but inasmuch as a patent is in question, any inquiry into the novelty or usefulness of the object is precluded from examination by virtue of the provisions of section 17 of the Law of 15th August 1852.

At the examination insight will be taken into both copies of the specification, respectively of the trade mark, pattern, or model without distinction, whether secrecy has been reserved or not. After which, if the copies have been presented under seal, they will be resealed with the official seal.

Together with this inspection the perfect conformity required of both copies of the aforesaid appendixes shall be verified, and should any disparity be discovered, the applicant will be invited to correct it at once, and by all means before the issuing of the Certificate of Protection.

For the purpose of duly affecting the above-mentioned examination, the Chief Manager of the Universal Exhibition will act in concert with a Committee of Experts, the constitution of which is left to his choice with the concurrence of the representative of the Royal Hungarian Ministry, in which Committee especially Mechanics, Chemistry, surgical and medical Science, Architecture, Physics, Agriculture, mechanical and chemical Technology, and Mercantile knowledge shall be duly represented.

These Experts, in so far as they are not already sworn, as Imperial and Royal Officials, have to declare on oath, in the presence of the Chief Manager, that they will conscientiously pass judgment and keep secrecy.

Their names will be submitted to the Minister of Commerce, together with the respective documents recording their having taken the oath.

No Certificate of Protection can be granted for objects which at the aforesaid examination are declared unsuited, according to the terms of the respective special Laws here-before referred to, either for protection by a patent, or for protection of trade marks, patterns, or models. The respective applications must consequently be returned. Applications for Certificates of Protection presented to the Chief Manager after expiration of the legal term of presentation, that is, after the opening of the Exhibition, or if the objects have been introduced later than the opening, after the time of such later installation, shall be refused without even examining the objects for the purpose of stating whether they are qualified or not.

ARTICLE II.

In granting the Certificates of Protection, the Chief Manager of the Universal Exhibition will always act strictly in accordance with the Official appointed for this purpose by the Royal Hungarian Ministry.

The Certificates of Protection will be issued free of expense by the Chief Manager of the Universal Exhibition and countersigned by the aforesaid Delegate of the Royal Hungarian Ministry, and must contain, according to the form hereunto annexed, the name and residence of the applicant, and also the name and residence of his agent, if the application has been made by him, a short description of the respective objects, the kind of protection granted (whether patent, trade mark, pattern, or model protection), finally the day on which the protection begins, to be stated according to the alternative mentioned in Art. II., and the day when it expires. The Chief Manager of the Universal Exhibition shall not receive applications tendered to him by holders of Certificates of Protection during the period of their validity, and with reference to the final sentence of Art. II. concerning the acquisition of a regular patent, or protection of trade mark, pattern, or model, the applicants must be referred to the authorities competent to receive such demands according to the special Patent and Protection Laws.

A refusal shall also be given to any holder of a Certificate of Protection who applies to the Chief Manager of the Universal Exhibition with a complaint against third persons on account of encroachments made upon his legal right of protection, as such complaints are to be judged by the competent authorities denoted in the special Patent and Protection Laws. In order to ascertain the facts of the case the said authorities shall apply to the Chief Manager of the Universal Exhibition for the transmission of an authentic copy of the specifications, trade marks, patterns, or models upon which the Certificates of Protection are founded, and the Chief Manager shall, without objection, and stating at the same time whether secrecy is to be kept or not, deliver the said copy under condition of its subsequent return, and after having the fact noted in the Register (see Art. IV.).

ARTICLE III.

Complaints against the refusal of Certificates of Protection are legally inadmissible; therefore, if made, they must be absolutely rejected.

Should, however, the legality of any certificate be contested, the competent authorities designated in the Patent and Protection Laws will, according to Art. I., have to decide the case.

Such complaints, if presented to the Chief Manager of the Universal Exhibition, shall not be accepted by him; he shall, however, direct the plaintiffs to the competent authorities.

The transmission of the specifications, trade marks, patterns, or models, on which the contested Certificates of Protection are founded, to the legal authorities to judge the case, shall be proceeded with according to the analagous rules of Art. IV.

ARTICLE IV.

For the Certificates of Protection granted, and the respective applications, a special register shall be kept in duplicate at the office of the Chief Manager of the Universal Exhibition, wherein the Certificates of Protection shall be entered previous to their delivery under consecutive numbers, with the date on which they were granted, and the other essential data pointed out in the Regulations, Art. II.; besides it shall be noted in a column of remarks whether the application contained a demand of secrecy for the specification, respectively the trade mark or pattern.

The number under which the application has been recorded shall be marked, not only on the Certificate of Protection, but also on the respective applications and on the covers of both copies of the specification, respectively of the trade mark, pattern, or model.

The applications, as well as both copies of the above-mentioned appendices, shall be kept safe on a file in successive order according to the numbers of record.

After the close of the Exhibition, that is, at the latest on the 15th November 1873, the Chief Manager shall transmit one copy of the record, together with the respective applications, and one copy of the specifications, respectively of the trade marks, patterns, or models presented with the same, to the Imperial and Royal Ministry of Commerce, and the other copy of the annexed documents above mentioned, through the Delegate of the Royal Hungarian Ministry, to the Royal Hungarian Ministry of Agriculture, Industry, and Commerce, for the purpose of being preserved in the archives of patents of both countries.

ARTICLE V.

Every case of granting a Certificate of Protection is to be published without delay by the Chief Manager of the Universal Exhibition in the Official part of the "Wiener Zeitung" (Vienna Gazette).

The analogous publication thereof in the Hungarian Official Gazette will be effected by the Delegate of the Royal Hungarian Ministry.

The inspection of the record of the Certificates of Protection granted is open to every one without restriction, but the inspection of the respective specifications, designs, models, &c. will be permitted only if the owner of the certificate did not ask for secrecy in his application.

ARTICLE VI.

Any doubts which might occur, in spite of the preceding regulations, with regard to the application of the present Law, shall be submitted to the decision of the Minister of Commerce.

Vienna, 15th November 1872. (Signed) BANHANS, m.p.

Number of record.

UNIVERSAL EXHIBITION OF 1873.

CERTIFICATE OF PROTECTION.

We, the undersiged, hereby confirm that Mr. (Mrs.) N.N.
of (agent), has acquired, according to, and under the terms of the Law of November 13, 1872, and of Article XXIV. of the Hungarian Law issued in 1872, legal protection by patent (or of trade mark, pattern, model), for the period from , (the day of the presentation), until the 31st day of December 1873, for the object below mentioned, and displayed at the Universal Exhibition of the year 1873; that is, for

Vienna

For the Royal Hungarian Ministry: The Imperial and Royal Privy Councillor and Chief Manager of the Universal Exhibition.

(Here is to follow the text of the Law of November 13, 1872.)

(c.)

SPECIAL RULES TO BE OBSERVED IN APPLYING FOR CERTIFICATE OF PROTECTION.

Summary of Contents.

I.—Introductory remarks.
II.—First requirement in granting certificates of protection.
III.—Second requirement in granting certificates of protection.
IIIa.—Extracts from the laws relating to patents, trade marks, and patterns and models.
IV.—Time for handing in petitions.
V.—By whom the petition is to be presented.
VI.—With whom the petition is to be deposited.
VII.—Form of the petition.
VIII.—Contents of the petition.
IX.—Enclosures of the petition.
X.—Procedure when handing in the petition.
XI.—Settlement of petitions when objections arise.
XII.—Issue of the certificate of protection.

The attention of Exhibitors at the Universal Exhibition of 1873 in Vienna, who desire to obtain a Certificate of Protection, in accordance with the Law of November the 13th, 1872 (Reichsgesetzblatt, No. 159), and with Article XXIV. of the Hungarian Law of the Year 1872, for the Article they exhibit, is called to the following requirements:—

I.—INTRODUCTORY REMARKS.

In the following paragraphs there is to be distinguished between "what is required by the Law," and "what is desirable" in the interest of a suitable and uniform treatment of the applications.

II.—First Requirement in granting Certificates of Protection.

The Certificate of Protection can only be granted "for Articles which "the applicant for Protection exhibits at the Universal Exhibition of "1873, at Vienna."

In the petition of the applicant for Protection, the Article to which the Protection is to apply must, therefore, be accurately specified. A general statement, as, for instance: "The goods to be exhibited by me," and so forth, is not sufficient.

It is desirable, when describing the article, to refer also to the data of his certificate of admission; it will likewise be useful, in cases where the article in question is already within the Exhibition buildings, or on its way thither, at the time of handing in the application, to state the already known or probable day of its entry.

Partners in collective Exhibitions are to specify the article for which they desire to obtain protection on their own behalf, by means of accurate data admitting of no doubt whatever.

III.—Second Requirement in granting Certificates of Protection.

The Certificate of Protection can only be granted for such "articles "as are suitable for obtaining a Protection of patents, marks, or "patterns," in conformity with the provisions of the Law of August the 15th, 1852 (Reichsgesetzblatt, No. 184), and of the two Laws of 7th December 1858 (Reichsgesetzblatt, Nos. 230 and 237). For the convenience of the applicants for Protection, an exact reprint of the paragraphs of the Laws in question is subjoined.

IIIA.—*Extract from the Patent Law of August the* 15*th*, 1852 (*Reichsgesetzblatt, No.* 184):—

"§ 1.

"An exclusive patent may be granted for each new discovery, invention, or improvement, with the exceptions contained in the following §§ 2, 3, 4, and 5, which has for its object—

"*a.* A new industrial produce, *or*
"*b.* A new means of production, *or*
"*c.* A new method of production.

"The patent may be applied for by an Austrian subject, or by a foreigner, so long as it does not pertain to those mentioned in the following paragraphs (2–5) as being unpatentable.

"By discovery, however, is understood every disclosure of an industrial mode of procedure, which, though used in former times, has since become entirely obsolete, or of one altogether unknown in the country.

"By invention is understood every representation of a new article with new means, or of a new article with means already known, or of a known article with other than the already applied means for the same article.

"Every additional appliance, arrangement, or mode of procedure to an already known or patented article, by means of which a more favourable result or a greater economy is to be obtained in the purpose of the article, or in the manner of its production, is regarded as an improvement or alteration.

"Any discovery, invention, or improvement is considered to be new, if it is neither known, by means of a printed publication, nor in operation in the country up to the time of the patent being applied for.

"§ 2.

"A patent is not granted for preparations of provisions, drinks, and medicines, nor for discoveries, inventions, or improvements, the practice of which is forbidden from public motives in regard to health, morality, or security, or the general interest of the State, according to the legal enactments.

"§ 5.

"An exclusive patent is not granted for a scientific principle, or a purely scientific proposition, not even where the principle or proposition is capable of immediate application to industrial objects; but every new application of such principle or proposition, by means of which a new industrial produce, a new means, or a new method of production is brought about, is patentable."

2. *Extract from the Law for the Protection of Trade Marks of December the 7th,* 1858 (*Reichsgesetzblatt, No.* 230).

"§ 1.

"By marks are understood in this law the special tokens which serve to distinguish between the products and goods of one manufacturer and those of another, destined for commerce (emblems, ciphers, vignettes, and such like).

"§ 3.

" 'No exclusive right can be obtained' for marks, which consist of
" such tokens as are generally in use in the case of certain descriptions
" of goods in commercial intercourse, nor for those which merely con-
" sist of letters, words, or figures, nor for state or provincial armorial
" bearings."

3. *Extract from the Law for the Protection of Patterns and Models for Industrial Products of December the 7th,* 1858 (*Reichsgesetzblatt, No.* 237).

"§ 1.

" By patterns and models is understood in this law every prototype
" referring to the form of an industrial produce, and suitable to the
" application thereunto.

" Whatever is said in the following about patterns applies with equal
" force to models."

"§ 3.

"An exclusive right to patterns which only consist in imitations of
" independent works of art is not recognised."

IV.—Time for handing in Petitions.

The petitions are to be handed in commencing from the 12th of January 1873, being the day on which the law of November the 13th, 1872, takes effect.

The latest date for handing in a petition varies, according whether the article in question arrives within the Exhibition buildings "before" the opening of the Exhibition, or whether it is allowed to be taken inside, subsequently, as an exception.

In the first case, "the day preceding the opening of the Exhibition is " the latest" on which the petition will be received; in the second case, the petition must be handed in "at the latest prior to the article arriving " within the building."

V.—By whom the Petition is to be presented.*

The petition is to be presented by the applicant for protection in person, or else by his authorised representative.

Sending in the petition by post, or its presentation by a simple messenger without legal authority is not allowed.

It is desirable that such representative be chosen who is permanently, or at any rate temporarily, resident at Vienna.

VI.—With whom the Petition is to be deposited.

The petition must be deposited with the Director-General of the Universal Exhibition.

As regards the immediate reception of petitions, the Law Office of the General-Director is empowered to act; the bearers of petitions are therefore to apply to the chief of the Law Office, or his deputy.

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* It is to be observed that the Austrian Minister of Commerce has authorised the Director-General to take also into consideration those applications which he may receive, through the Exhibition Commissioners from abroad, so that the English Exhibitors can address their applications to the Office of the Royal Commission in London, either personally or through an agent, or send them by post to the Secretary of the Commission at Vienna, Mr. Cunliffe Owen, 66, Praterstrasse. (*See* Official Correspondence.)

VII.—Form of the Petition.

The petition is to be handed in unstamped.

It can be drawn up in any language, but the use of the German language is above all things desirable.

The petition is to be written in black ink on durable paper, and is to be signed with his own hand, either by the applicant for protection or his authorised representative.

What has been said here as regards the petition, equally applies to its enclosures.

VIII. CONTENTS OF THE PETITION.

Concerning the Contents of the Petition the following has to be remarked, that:—

I. IN PETITIONS FOR PROTECTION OF A PATENT.

1. It is requisite to state accurately the article to which the protection shall apply.
2. It is desirable to refer to the data of the receipt of notice.
3. It is requisite to state the appellation (the title) of the discovery, invention, or improvement, in its essential points.
4. It is requisite to state that the protection of the patent is desired.
5. It is desirable to state whether the article in question has arrived within the Exhibition building, and if so, on what day.
6. It is requisite in case the petition is handed in by an authorised representative, to state his Christian and surname, business and residence.
7. It is requisite to state the Christian and surname, business and residence, of the applicant for protection. This statement is likewise requisite when the rights of a patentee are to be exercised by a firm differing in name with that of the applicant for protection; in that case, the firm selected is also to be mentioned.

II. IN PETITIONS FOR PROTECTION OF MARKS:

1. Same as in I. 1.
2. „ „ I. 2.
3. It is requisite to describe in words the nature of the marks.
4. It is requisite to state that the protection of the mark is desired.
5. It is requisite to state for which Industrial undertaking the mark is intended.
6. Same as in I. 5.
7. „ „ I. 6.
8. „ „ I. 7.

III. IN PETITIONS FOR PROTECTION OF PATTERNS.

1. Same as in I. 1.
2. „ „ I. 2.
3. It is requisite to state that the protection of the pattern is desired.
4. Same as in I. 5.
5. „ „ I. 6.
6. „ „ I. 7.

IX.—ENCLOSURES OF THE PETITION.

With the petition for protection of patents must be enclosed:—

a. An accurate description of the article in question *in two identical copies under two separate covers*, on each of which the article for protection of patent (the discovery, invention, or improvement in substance) and the name of the applicant for protection is to be visibly written. By description is here meant the specification of the discovery, invention, or improvement which has only been stated in substance in the petition, drawn up in such manner that every connoisseur is enabled to manufacture the article according thereto, without having to add new inventions, supplements, or improvements. The specification, as already mentioned, is likewise to be signed by the applicant for protection or his authorised representative; whether he wishes to hand it in open or sealed, is left to his pleasure.

b. In case drawings, patterns, or models are necessary to make the specification intelligible, these must also be enclosed in two identical copies, the former, moreover, executed with a durable colour. *These two copies must likewise be signed as well as the specification, and be enclosed in two separate covers with the superscription as required above in the description.* With models, the bulk of which does not permit of a cover being used, the signature as well as the description of the article for protection is to be given on a special slip affixed in a suitable place.

c. In case an authorised representative acts for the applicant for protection, the legal authorisation made out in his (the representative's) name must be appended in original. The signature of the authorisor is to be attested judicially or by a notary, if the authorisation is made out at home. If made out abroad, it is to be verified by means of the legalisation of an Imperial and Royal Austro-Hungarian mission or consulate, or where it is allowed by treaty, by the respective judicial authorities.

With the petition for protection of marks must be enclosed:—

a. Two identical copies of the marks in separate covers, on each of which the exhibited article to which the protection shall apply, and the name of the applicant, is to be visibly written.

The production of a third copy of a mark is also desirable, and need not have a cover, as it is only intended for official attachment to the Certificate of Protection, and is, with it, returned to the applicant for protection.

b. In case an authorised representative acts for the applicant for protection, his authorisation, furnished with those requirements denoted above as regards petitions for protection of patent.

With the petition for protection of patterns must be enclosed:—

a. Two identical copies of the pattern or model in separate covers, on each of which the exhibited industrial produce, to the shape of which the pattern or model has been transferred, as also the name of the applicant, is to be visibly written.

b. In case an authorised representative acts, an authorisation made out just in the same way as previously mentioned.

X.—PROCEDURE WHEN HANDING IN THE PETITION.

The bearer of a petition is to deliver it to the Chief of the Law Office, or, in his absence, to his representative. It is examined at once in the presence of the bearer as to whether the petition is properly drawn up and signed, and whether the prescribed enclosures are appended. Should a defect become apparent from this examination which the bearer cannot at once rectify himself, the petition and enclosures are returned to him for completion, stating the reason why. If, on the other hand, the petition is drawn up and prepared as prescribed, the official treatment of it will commence. This consists, in the first place, of noting on the outside of the petition, in the presence of the bearer, the day and hour of its presentation, and of handing him a receipt for the documents in question.

This receipt is to be taken great care of.

If the petition has been returned to the bearer by reason of some defect, it is considered as "not handed in," and it is, consequently, the business of the applicant for protection to have regard to the rectified petition being again presented within the term mentioned in § 3 of this Notification.

XI.—SETTLEMENT OF PETITIONS WHEN OBJECTIONS ARISE.

If the Certificate of Protection required cannot be made out, either because the article in question is declared by the experts as being "unsuitable for protection," or because it has "failed to be lodged" in the Exhibition, the bearer of the petition will be informed thereof and requested to take back the enclosures and deliver up the receipt in person, at same time giving proof of his identity.

If the only hindrance to the making out of a Certificate of Protection consists in the two identical copies of the petition-vouchers not agreeing as required by law, the applicant for protection is called upon to remove the obstacle within a short period, which is not extendable. After the term has expired without his having done so, the application will then be formally refused, and the enclosures of the petition returned in the same way as previously mentioned.

XII.—ISSUE OF THE CERTIFICATE OF PROTECTION.

The Certificate of Protection will by no means be issued before the article in question has arrived within the Exhibition building. It is accordingly in the interest of the applicant for protection to announce the entry of the article to be exhibited to the Law Office of the Director-General at once.

The Certificate of Protection is delivered to the applicant in person, or if he should not be at Vienna, in the ordinary course by post.

The Director-General,
(Signed) BARON VON SCHWARZ-SENBORN.

42, Praterstrasse, Vienna,
March 1873.

VII. (*d.*) OFFICIAL CORRESPONDENCE RELATING TO CERTIFICATES OF PROTECTION.

SIR, 42, Praterstrasse, Vienna, 20th March 1873.

I HAVE the honour to hand you herewith a translated copy of a communication, dated March 9th, 1873, No. 7234, which I have received from His Excellency the Imperial and Royal Minister of Commerce, referring to the certificates of protection for exhibitors at the Universal Exhibition of 1873, in Vienna, and beg you will communicate the contents thereof to the exhibitors of your country.

I beg leave to take this opportunity to ask your kindness in another question arising from the fact that foreign exhibitors are but too frequently quite ignorant of the laws of Austria.

In fact, it has become almost a rule with applications for Protection Certificates from abroad to neglect not only the requirements of the law, namely, that applications should be made, either by the applicant *personally* or by his agent duly authorised, but to omit also other essential requirements. The applications are, as a rule, not provided with the *two separate covers* required by law to contain the two copies of specifications, drawings, trade marks, models, &c.; the *signature* by the applicant of the specification is often wanting; sometimes the *object* to be protected is not indicated, and even the *kind of protection* wished for, whether it be a patent, trade mark, or model protection, is occasionally omitted.

You will therefore much oblige me, Sir, and promote the interest of the cause if you will, on receiving applications for Protection Certificates call the attention of applicants to the provisions of the law and point out to them the defects, if any, of their applications and kindly send them afterwards to me to be dealt with according to law and without transgressing its formal provisions.

I remain, Sir,
Your most obedient servant,
(Signed) SCHWARZ-SENBORN.

Philip Cunliffe Owen, Esq.,
Secretary, Royal British Commission
for the Vienna Universal Exhibition.

[*Translation.*]

SIR,

IN reply to your letter of the 26th ultimo, No, 1299, I do not hesitate to give to your Excellency the authorisation to receive such applications for "Certificates of Protection" as will be sent to you through Foreign Exhibition Commissions, and to deal with them according to law, provided they be drawn up and supplemented in strict accordance with the provisions contained in Art. I. of the law of the 13th November 1872, and the special regulations issued on the 15th November, 1872. It is understood that the actual date on which the applications reach your Excellency will be the only rule to decide whether they are presented in due time,

I have the honour to remain, &c,, &c.,
The Imperial and Royal Minister of Commerce,
(Signed) BANHANS.

To His Excellency
Baron William de Schwarz-Senborn,
Chief Manager of the Vienna Universal Exhibition.

(*Translated by Dr. Weinmann.*)

APPENDIX Y.

VIENNA PATENT CONGRESS, 1873.

RESOLUTIONS adopted on the 4th, 5th, 6th, 7th, and 8th of August 1873.

I. The protection of inventions should be guaranteed by the laws of all civilised nations, because—

(*a.*) The sense of right among civilised nations demands the legal protection of intellectual work.

(*b.*) This protection affords, under the condition of a complete specification and publication of the invention, the only practical and effective means of introducing new technical methods without loss of time, and in a reliable manner, to the general knowledge of the public.

(*c.*) The protection of invention renders the labour of the inventor remunerative, and induces thereby competent men to devote time and means to the introduction and practical application of new and useful technical methods and improvements, and attracts capital from abroad, which, in the absence of patent protection, will find means of secure investment elsewhere.

(*d.*) By the obligatory complete publication of the patented invention, the great sacrifice of time and of money, which the technical application would otherwise impose upon the industry of all countries, will be considerably lessened.

(*e.*) By the protection of invention, secrecy of manufacture, which is one of the greatest enemies of industrial progress, will lose its chief support.

(*f.*) Great injury will be inflicted upon countries, which have no rational patent laws, by the native inventive talent emigrating to more congenial countries, where their labour is legally protected.

(*g.*) Experience shows that the holder of a patent will make the most effectual exertions for a speedy introduction of his invention.

II. An effective and useful patent law should be based on the following principles:—

(*a.*) Only the inventor himself, or his legal representative,* should be entitled to a patent.

(*b.*) A patent should not be refused to a foreigner.

(*c.*) It is advisable, in carrying out these principles, to introduce a system of preliminary examination.

(*d.*) A patent should be granted either for a term of 15 years, or be permitted to be extended to such a term.

(*e.*) Simultaneously with the issue of a patent a complete publication of the same should take place, rendering the technical application of the invention possible.

(*f.*) The expense of obtaining a patent should be moderate; but, in the interest of the inventor, a progressive scale of fees should be established, inducing him to abandon a useless patent.

(*g.*) Facilities should be given, by a well organised patent office, to obtain in an easy manner, the contents of the specification of a patent as well as to ascertain what patents are still in force.

(*h.*) It is advisable to establish regulations, according to which the patentee should be compelled, in cases in which the public interest may require it, to allow the use of his invention to all suitable applicants for an adequate compensation.

(*i.*) The non-application of an invention in one country shall not involve the forfeiture of the patent, if the patented invention has been carried into practice at all, and if it has been rendered possible for the inhabitants of such country to purchase and make use of the invention.

(*k.*) In all other respects, and particularly as regards the proceedings in the granting of patents, the Congress refers to the English, American, and Belgian Patent Laws, and to the draft of a patent law prepared for Germany by the Society of German Engineers.

III. Considering the great differences in present patent administration and the altered international commercial relations, the necessity of reform is evident, and it is of pressing moment that Governments should endeavour to bring about an international understanding upon patent protection as soon as possible.

IV. The Congress empowers the preparatory Committee to continue the work commenced by this first International Congress, and to use all their influence that the principles adopted be made known as widely as possible and carried into practice.

V. The Committee is likewise authorised to endeavour to bring about an exchange of opinions on the subject, and to call, from time to time, meetings and conferences of the friends of patent protection.

VI. To this end, the preparatory Committee is hereby appointed to act as a permanent Executive Committee with power to add other members to their number, and to appoint the time and place for the next meeting of the Congress, in case such a meeting should be considered necessary for the promotion of the foregoing resolutions.

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* This was understood to include the nominee or authorised agent of the inventor. —T. W.

The Honorary President of the International Patent Congress,
Baron von Schwarz-Senborn.
The President of the International Patent Congress,
William Siemens.

APPENDIX Z.

VIENNA PATENT CONGRESS, 1873.

Meeting of the **Executive Committee** (appointed by the International Patent Congress to carry out the resolutions of the Congress, passed on the 4th, 5th, 6th, 7th, and 8th of August 1873, with power to add to their number) held on Saturday the 9th of August, Baron von Schwarz-Senborn, honorary President of the Congress, in the chair.

PRESENT:

William Siemens, President of the Congress.

Th. Webster, Q.C.
Mr. Hamilton Hill.
Mr. Eugen Langen.
Dr. v. Rosas.
Dr. Jannasch.
Dr. H. Grothe.
Dr. Weinmann
Dr. Jur. Rosenthal.
Syndicus Dr. André.
Hofrath v. Engerth.
Professor Blake.
Mr. Carl Pieper, C.E.

It was resolved,—

1st. That the Honourable J. M. Thacher, Mr. B. B. Hotchkiss, and Mr. S. Remington, of the United States, be added to the committee.

2nd. That Baron von Schwarz-Senborn be president of the executive committee, whether residing at Vienna or elsewhere.

3rd. That Dr. William Siemens be requested to write a preface or introduction to the proceedings of the Congress, to be dedicated to Baron von Schwarz-Senborn.

Dr. W. Siemens acceded to this request.

4th. That Mr. Carl Pieper, C.E., of Dresden, be the general secretary of the executive committee.

5th. That Dr. v. Rosas, of Vienna, be treasurer of the executive committee.

6th. That Dr. Rosenthal, of Cologne, and Dr. v. Rosas act as special assistants to the general secretary for the publication of the proceedings.

7th. That the members of this committee residing in foreign countries constitute special local committees of their respective nationalities, with power to add to their number, to carry out the resolutions of the Congress.

Each local committee to be empowered to enrol members, call meetings, and collect subscriptions of one pound sterling, or upwards, per annum, to be accounted for to the general secretary and treasurer, and to do such acts as may be necessary for carrying out the resolutions of the Congress.

8th. That the president and general secretary prepare byelaws to be submitted to a general meeting for approval.

The Honorary President of the International Patent Congress,
Baron de Schwarz-Senborn.
The President of the International Patent Congress,
William Siemens.

DR. F. L. WEINMANN.

YARN CONGRESS.

MEMORANDUM on the CONGRESS held in VIENNA for discussing the Question of a UNIFORM NUMBERING OF YARN, by Dr. FR. L. WEINMANN.

IN paragraph 11 of the General Programme of the Vienna Universal Exhibition, issued on the 16th September 1871, by His Imperial Highness Archduke Rainer, President of the Imperial Austrian Commission, and His Excellency the Director-General Baron von Schwarz-Senborn, it was intimated that during the Exhibition various international congresses and conferences would be arranged for discussing important matters, to which either the Exhibition itself might give rise, or which would be specially selected as subjects of international discussion.

Among the questions specified for such discussion there were mentioned the questions of "intellectual property," of the "improvement of public taste," of "the promotion and diffusion of arts of design," of "economy of transport," of "obtaining the highest efficiency of machines," of "reducing the price of food, whether by increased production, better organisation of markets, reformed cookery, or new methods of preserving food," of the "education of woman and the improvement of her social condition," &c.

The first Congress, in accordance with this programme, which was specially suggested by the Chamber of Commerce and Industry of Lower Austria, was held on the 7th, 8th, 9th, 10th, and 11th July, in the session hall of the Lower Austrian *Gewerbe Verein* (Industrial Society). Its object was, in the terms of the Special Programme (No. 61) issued by Baron von Schwarz-Senborn, on the 10th July 1872, (*see* Appendix A.)—

> (*a.*) The investigation of the question: "Whether the various systems of numbering yarn at present in use, which by their great dissimilarity impede the trade in woven materials, can be assimilated and rendered uniform, or at least reduced to a smaller number?"
>
> (*b.*) "The discussion and adoption of measures for carrying out the plans which may be proposed and agreed upon as the most practical."

Several months previous to the opening of the Exhibition English translations of the programme, and other notices, bearing upon this Congress, were published in the newspapers in London, and other parts of the country, and copies of the programme sent for distribution by the Royal British Commission to the various Chambers of Commerce in those districts in which, through the nature of the particular branches of manufacture, the subject was likely to attract some attention. The response from British manufacturers, it must be admitted, was but very small, although the subject appeared to be one of great general interest, and of particular importance to Englishmen, especially those engaged in the various branches of textile industry; and although the participation in the proceedings of the Congress was not restricted to exhibitors, but was, by a communication received from his Excellency Baron von Schwarz-Senborn, on the 4th June 1873, expressly extended to every one who took an interest in the matter. (*See* Appendix B.)

In accordance with the terms of the programme mentioned, a preliminary Committee was appointed by the Director-General to draw up certain propositions corresponding with the questions to be brought under discussion at the Congress, which were as follows:—

(1.) "What disadvantages result to the trade in woven materials from the many different systems in use for numbering yarn?"

(2.) "Is it possible to introduce a uniform system of numbering for all woven textures, such as are made of silk, woollen, card wool, linen, cotton, and jute yarns?"

(3.) "Should that appear impossible, cannot a uniform system of numbering be applied to at least some textures; or is the adoption of a separate system for each kind to be recommended?"

(4.) "What system or systems of numbering does it seem practical to propose?"

(5.) "What are the difficulties that obstruct the introduction of the intended alteration in the several descriptions of woven materials, and by what means can they be removed?"

(6.) "What means are to be employed to carry into practice the improvements which have been deemed worthy of adoption?"

Suggestions, having reference to either of these questions, or separate propositions, were especially invited to be sent to the Director-General for the consideration of the preparatory Committee, previous to the meeting of the Congress.

One of the first communications received in answer to this invitation proceeded from M. Fritz Pasquay, of the carded yarn and silk factory of Pasquay frères & Cie., Wasselnheim, Alsace (*see* Appendix C.), a copy of which was expressly sent to the Royal British Commission by Baron von Schwarz-Senborn, who seemed to attach considerable importance to an effective representation of English manufacturers and yarn spinners at the Congress in question.

M. Pasquay, speaking from many years' experience, stated that the disadvantages of the present diversity of numbering were so patent to every man of business, and so onerous, that they scarcely required explanation. In every country, he remarked, there is not only a separate standard for each sort of yarn in use, but sometimes several modes of numbering the same sort of yarn are adopted, mentioning in particular France, where besides the metrical system of weight and measures, other systems are employed. M. Pasquay, therefore, in order to get rid of this medley of systems, strongly advocated the adoption of the only rational system of numbering for all countries in which the meter and kilogram systems have been introduced, or where their introduction is in prospect, namely, *that by which the number expresses the proportion of the length in meters to the weight in grams, and respectively of kilometers to kilograms, so that yarn, of which a length of* 1,000 *meters weighs* 1,000 *grams, would be marked No.* 1, *and so forth.*

This "kilogrammetrical system" is, according to M. Pasquay's statement, already partly in use; for instance, for carded yarns at Rheims and in Alsace, and also for silk-waste yarns, floss, and burling silk, &c.; and he is of opinion that its introduction will not present any great difficulties, since this system perfectly agrees with the metrical system of weight and measures already in force in the most important countries on the continent—and probably soon to be adopted by all others—and also with the decimal system.

More disturbing for the trade than the introduction of a uniform international system of numbering is, in M. Pasquay's opinion, the *making up*, or reeling of the different sorts of yarn. As a means of overcoming that difficulty M. Pasquay recommended that "in order to achieve a uniform 'making up' (reeling), and to maintain with this the proposed kilogrammetrical system of numbering, the thread length of the hanks should also consist of a round decimal meter number; for example, 1,000 *meters in hanks of* 100 *meters each.*" In practice he thinks the coarser yarns might, without detriment to the carrying out of the system, be delivered in hanks of more or less than 100 meters in length, and in order to facilitate the general adoption as much as possible, he also proposes a round number, viz., 1·50 m., as the diameter of the reel, since hanks of 1½ meter in circumference can be easily introduced everywhere, as demonstrated by 15 years' experience.

Besides this very valuable communication of M. Pasquay, copies of which had likewise been forwarded for distribution to the Chambers of Commerce of Great Britain, a copy of a report was distributed some time previous to the meeting of the Congress. This report, some extracts of which will be found in the Appendix D., had been issued by the Chamber of Commerce of Mulhouse, and was drawn up by a special committee of the Society of Industry of that place. In the main it agrees with the propositions of M. Pasquay, with some modifications, particularly as regards the diameter of the proposed alteration of the reels.

On the 7th July the first meeting of the members of the Congress took place in the session hall of the Industrial Society of Lower Austria (Eschenbachgasse, No. 11), Chevalier von Reckenschuss, President of the Austrian Chamber of Commerce, and likewise of the preparatory Committee, in the chair.

Only a small number of gentlemen attended (32 out of 115 enrolled members), mostly manufacturers from different parts of Germany, Austria, delegates from Belgium, France, Alsace, Switzerland, Sweden, Russia, and only two Englishmen, namely, the editors of "Engineering," Mr. James Dredge, and Mr. Moritz Müller. Mr. A. Hofman, Vice-President of the Chamber of Commerce of Bradford, had sent a letter of apology—which was read to the meeting—regretting his inability to attend, but in general approving the objects to be accomplished by the Congress. Dr. Weinmann, member of the staff of the Royal British Commission, attended by special instructions from Mr. Philip Cunliffe Owen, for the purpose of assisting the English members as translator, and making a report of the proceedings without, however, taking any part in the deliberations of the Congress.

Dr. F. Migerka, Imperial Councillor in the Ministry of Commerce, as Delegate of the General Direction of the Vienna Exhibition, addressed the meeting, pointing out that the attempt to bring about a uniform numbering of yarn affected one of the most important branches of industry, which, though its staple article was a commercial commodity of almost universal use, was, through its antiquated manipulation, quite isolated in the midst of the vast progress and extension of railways, telegraphs, postal and telegraph conventions, treaties of commerce, international exhibitions, &c., which rapidly removed the obstacles impeding national intercourse and facilitated the extension of international commercial markets.

Acknowledging the undeniable necessity of reform in the systems in use for numbering yarn, the preparatory Committee had, after mature deliberation, drawn up an *Exposé* (*see* Appendix E.), which was to form the basis of discussion for the Congress, and while recommending the adoption of a system the elements of which consisted in variable lengths but fixed weight, they distinguished, considering the requirements of manufacturers, the question of numbering from the manner in which yarns are required for the market, leaving the solution of the question as to whether measures of length or weight should be the rule to be disposed of by general agreement. Admitting the great difficulties arising from long-established usage, the necessity of certain alterations in the plant in use, and of effecting a reform on a rational basis, the Committee placed much confidence in the exertions of the permanent Executive Committee to be elected and supported by the present Congress.

A draft of rules (*see* Appendix F.) regulating the proceedings of the Congress having been submitted by the Chairman, and adopted, with the modification that the elections and divisions should take place by written votes only in case of this being specially demanded by a member, the Congress elected, on the proposition of Herr Gottlieb, Delegate of the Chamber of Commerce of Leipsic, the Chairman, Chevalier Von Reckenschuss, President by acclamation.

The election of vice-presidents and secretaries was postponed till the next meeting.

The first article of the propositions (*see* Appendix E.) submitted by the preparatory Committee for discussion, in accordance with the original programme, was as follows :—

I. "The present systems of numbering yarn obstruct the trade in woven textures, and subject it to great inconveniences.

"Considering that yarn has become a staple article of international commerce which is being continually developed by treaties of commerce, new railway enterprises, telegraph lines, international exhibitions, &c., it is highly desirable that the removal of the acknowledged obstacles be strongly supported.

"The present time appears to be the most opportune period for that purpose, as the use of the system of metrical weights and measures, already adopted by many States, has recently been introduced in an industrial territory comprising 70,000,000 inhabitants."

Director von Pacher, of Vienna, Reporter of the Committee, supported the adoption of this paragraph, mentioning that in his comparative tables (*see* Appendix E., Supplements I. and II.) he had enumerated 24 different systems, an examination of which proved, that mostly local and accidental circumstances (especially weights and measures) chiefly determined their introduction, and not, as might be supposed, causes attributable to the nature of the various fibrous substances and the real requirements of the manufacture and the consumption of the textures, much less reasons of commerce.

The inconvenience of the present diversity was principally observable in two different directions—firstly, in the international yarn trade; secondly, in the manufacture of mixed fabrics.

After these points had been discussed in detail, Article I. of the propositions recommended by the Committee was adopted unanimously.

The next article of the Committee's propositions was to the following effect:—

II. "It appears that if the choice of the standard of weights and measures be made to correspond with the nature of the web, it is possible to effect a numbering of all textures on the same principle."

Director von Pacher observed that with reference to this paragraph the Committee adopted the mode of submitting the points to be discussed to representatives of some of the principal branches of textile industry for their opinion, and though it was admitted by most of them that the introduction of a universal system of numbering for *all* woven textures was all but impossible; each of these gentlemen recommended for his own particular branch the adoption of the metrical system as the most practical, for which reason the Committee recommended the acceptance *in principle* of a common and uniform system of numbering.

M. Karcher, of Colmar, Delegate of the Chamber of Commerce of Mülhausen, on the other hand, was of opinion that the greatest obstacles against the introduction of uniform numbering of yarn would be raised by England and Italy, and declared it very desirable and essential, before deciding the question, to obtain the opinion of representatives of these countries, England being the most important factor to be considered in this matter. Unfortunately, there was no one present from England in a position to respond to this urgent and reiterated request. The Chairman remarked that the Chambers of Commerce of Manchester and Bradford had notified their intention of taking part in the Congress by Delegates, whereupon Article II. was likewise adopted unanimously.

In the second meeting of the Congress, which took place in the hall of the Society of Engineers and Architects on the 8th July, Ministerial Councillor Dr. Migerka, of Vienna, and Mr. Henry Lister, of Bradford, were elected Vice-Presidents, and Mons. J. Duckerts, representative of the yarn spinners of Verviers, Dr. Hermann Grothe, Civil Engineer of Berlin, and Dr. Max Weigert, Manufacturer, of Berlin, Secretaries, after which election the meeting entered into the discussion of Article III. of the Committee's proposition.

III. "The principle of such a uniform numbering recommends itself in the following way:—

"The number will be determined by the number of meters weighing a gram, decagram, hectogram, or kilogram.

"Considering that the standards of yarn in trade are independent of the principle of numbering, and that in establishing the standards technical circumstances are to be considered, the various textures will be brought into the market, as heretofore, partly according to measure of length, partly according to weight."

In support of this article Director von Pacher pointed out the difference between these two principles—viz., *weight constant length* and *variable* (which is the case with cotton, linen, worsted, carded, and also with jute yarn) and *length constant* and *weight variable* (as is the case with silk and partly also with jute); the former principle was preferable, as being already applied to most of the branches of that kind of industry, and because the raw material is bought by weight, whilst the number is increased in proportion to the labour and expenses required for spinning the quantity on hand.

A letter by General Morin, President of a Committee of Delegates of French Spinners and Manufacturers, which met at the Conservatoire of Fine Arts and Trades, in Paris, approving the introduction of a uniform numbering of yarn on the basis of the metrical system (*see* Appendix G.), and two letters of a similar nature from the Chamber of Commerce and the Society of Industry at Rheims (*see* Appendices H. and I.), having been read, the discussion of Article III. was adjourned till the following day.

In this third meeting, which took place in the session hall of the Gewerbe-Verein on the 9th July, Ministerial Councillor Dr. Migerka (in the chair) communicated to the meeting a letter (above alluded to, see Appendix K.) from Mr. A. Hoffmann, Vice-President of the Chamber of Commerce of Bradford, and announced the arrival of Mr. William W. Shaw, Delegate of the Chamber of Commerce of Rochdale, when the debate on Article III., to which several amendments had been proposed, was resumed. During the discussion which followed, the English system of yarn numbering was made the subject of special comment by several of the speakers.

Herr Bahse, Delegate of the Chamber of Commerce of Chemnitz, submitted that the English system of numbering, which would not so easily be abandoned, cannot be dispensed with for the present in Saxony, though it was desirable, and one of the objects of the Congress, to endeavour to persuade English manufacturers to adopt a system of yarn numbering more in conformity with that prevailing on the Continent. Herr Ehret, Delegate of the Chamber of Commerce of Plauen, Saxony, likewise advocating the adoption of the metrical system, complained that the admission of the English system would make all attempts at reform illusory so long as the English manufacturers and spinners abstained from joining the movement.

Ultimately Art. III. in its amended form—

> "The metrical system is the principle recommended for such uniform numbering.
>
> "The number of the spun yarn is supplied by the number of meters contained in one gram"—

was passed.

In consequence of the alterations adopted, and the great number of amendments proposed, a change in the next articles of the propositions of the Committee had been rendered necessary, the discussion of which occupied the fourth meeting, which was held at the same place on the 10th July, Ministerial Councillor Dr. Migerka again in the chair. The various amendments having been disposed of, the Committee was instructed to submit to the Congress at its next meeting a revised form of the remaining Articles of the resolution passed in principle. The new rendering having been approved of, the Congress, in its fifth meeting, on the 11th July, finally adopted Articles IV. to VII. in the following form:—

Art. IV. "The length of the hank is fixed, for all kinds of yarn, at 1,000 meters, with subdivisions of 10 bundles (skeins) at 100 meters each."

Art. V. "The length of the reel, and consequently the number of threads in a bundle (skein) will be determined, after mature consideration of the technical circumstances, for all kinds of yarn, by the permanent Executive Committee."

Art. VI. "The correctness of the number of a quantity of yarn is legally to be judged only by a more or less large number of meters, which must in no case be less than one hank.

"The determination of the special conditions in this respect, as well as the details of the limits of deficiencies respecting the correctness of the numbers of the several kinds of yarn according to their quality, will be settled by the permanent Executive Committee."

(*a.*) "The members of the permanent Executive Committee will be elected by the Congress.

(*b.*) "The members residing in Vienna form amongst themselves a sub-committee, whose duty it is to manage the affairs of the General Executive Committee until the meeting of the next Congress.

(*c.*) "It is desirable that the foreign members form, as soon as practicable, local committees, it being at the same time the duty of *all* committee members of one country to circulate as extensively as possible within their sphere of action the resolutions of the Congress.

(*d.*) "General organic arrangements for the Congress must be approved, either verbally or in writing, by the majority of the members of the entire permanent Executive Committee.

(*e.*) "The Chambers of Commerce are entitled to send to the meetings of the Congress delegates who will enjoy the same rights and privileges as the regular members."

The Congress then proceeded to the election of the members of the permanent Executive Committee, a list of whose names is given in the Appendix. (*See* Appendix Q.)

At the proposition of Herr Gottlieb, Delegate of the Chamber of Commerce at Leipsic, it was unanimously determined to hold the next meeting of the Congress in 1874, at Brussels.

Previous to the adjournment of the fourth meeting the members of the Congress, being either spinners of carded yarn or manufacturers using the same in their manufactures, presented to the Chairman a signed declaration to the effect—"That they have jointly agreed to adopt the length per hank of 1,000 meters, subdivided in 10 bundles (skeins) of 100 meters each with a reel of 1·50 m. in circumference, or five bundles (skeins) of 200 meters each." (*See* Appendix M.)

This declaration was received with general applause.

A similar declaration was made at the opening of the concluding meeting on the part of the spinners of linen yarn, weavers, bleachers, and throwsters, with the addition that they considered a length of reel of 2½ meters most practicable for the coarser and 1¼ meter for the finer numbers of yarn. (*See* Appendix N.)

The usual votes of thanks to the chairman and the preparatory Committee terminated the proceedings of the first International Yarn Numbering Reform Congress.

Summarising the result of the five days' labour of the Congress, it must be admitted that it has achieved a success —though at present chiefly in a moral sense—greater than was at first anticipated. The diversity of opinion which manifested itself during the debates at the first and second meeting was so great that many of the members predicted that the meeting of the Congress would prove a failure. Gradually, however, as the debates progressed, an interchange of opinions removed all difficulties, and established a highly satisfactory unanimity of purpose and an endeavour to arrive at an agreement on practical principles, which will form a basis for the achievement of a reform admitted on all sides to be greatly needed in order to remove the trammels under which a great branch of industry is labouring at a disadvantage, and it was generally considered a source of great regret that, while all other countries manifested a great interest in the Congress and the objects it had in view, England should have been so scantily represented. The Congress has, however, done Great Britain the honour of electing some of her large manufacturers members of the permanent Executive Committee.

Since the Congress separated, the Austrian members of the permanent Executive Committee have constituted themselves (27th November last), and issued a circular (*see* Appendix S.) dated the 10th December 1873, inviting the members of the same Committee residing in foreign countries to co-operate with them for the purpose of obtaining a general recognition of the principles adopted by the Congress, and of carrying into effect its resolutions.

The Austrian Committee has at the same time issued the first four numbers of a journal published both in the German and French languages, entitled "Amtliches Correspondenzblatt für die Einführung einer einheitlichen Garn Numerirung"

(Correspondance officielle pour l'introduction du numérotage uniforme du fil), whose columns will be entirely devoted to the development of the views and the achievement of the objects of the Congress.

FR. L. WEINMANN.

London, January 1874.

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APPENDIX A.

No. 61.
[Translation.]

VIENNA UNIVERSAL EXHIBITION, 1873.

Proposed International Congress for Discussing the Question of Uniform Numbering of Yarn.

A.—General Programme.

1. At the suggestion of the Chamber of Commerce and Industry of Lower Austria an International Congress will be held in connexion with the Universal Exhibition at Vienna, to which, in accordance with the annexed special programme, will be submitted :—

(*a.*) The investigation of the question, Whether the various systems of numbering yarn at present in use, which by their great dissimilarity impede the trade in woven materials, can be assimilated and rendered uniform, or at least reduced to a smaller number?

(*b.*) The discussion and adoption of measures for carrying out the plans which may have been proposed and agreed upon as the most practical.

2. This Congress will be held during the time of the meetings of the jurors of the Exhibition, and the date of its commencement will be duly made known previously.

3. Every Exhibitor in either branches of the Textile Industry classified under Group V., Sect. *a*—*d*, will, on application, receive a card of admission to the General Meetings of the Congress, as well as to the Special Committee Meetings, and be entitled to take part in the proceedings and to vote.

Applications for admission to the Congress must be addressed to the respective Commissions appointed for the Exhibition. In accordance with these applications, which must be sent by the respective Commissions to the Director-General of the Exhibition before the 15th of March 1873, cards bearing the Exhibitor's name will be forwarded.

The Director-General reserves to himself the right of inviting other experts to take part in the Congress.

4. An *exposé* drawn up by the preliminary Committee, which, following the questions of the special programme, will contain certain definite propositions for discussion, will be sent to the respective Commissions for the Exhibition for distribution in January 1873, and be kept ready for the members of the Congress.

5. In the first General Meeting, which will be opened by the Chairman of the preliminary Committee, a president and secretary will be elected, the rules of proceeding submitted, and sub-committees formed for the different kinds of spinning materials, which sub-committees will each appoint a reporter to prepare a report for submission to the General Meeting of the Congress.

6. The language to be made use of in the deliberations of the Congress will be, as a rule, the German; but every member is at liberty to avail himself at his choice of either the English, French, or Italian languages.

7. All communications, essays, and propositions, having reference to the items of the programme, must be addressed previous to the opening of the Congress to the Director-General of the Exhibition, but during the time of the meeting of the Congress to the bureau of the same.

The proceedings and resolutions of the Congress will afterwards be published and distributed to the respective members.

The President of the Imperial Commission,
ARCHDUKE RAINER.
The Director-General,
BARON VON SCHWARZ-SENBORN.

Vienna, 42, Praterstrasse,
July 10, 1872.

B.—PROGRAMME OF QUESTIONS.

1. What disadvantages result to the trade in woven materials from the many different systems in use for numbering yarn?
2. Is it possible to introduce a uniform system of numbering for all woven textures, *i.e.*, silk, woollen, card wool, linen, cotton, and jute yarns?
3. Should that not appear possible, cannot a uniform system of numbering be applied to at least some textures, or is the adoption of a separate system for each kind to be recommended?
4. Which system or systems of numbering does it seem practical to propose?
5. What difficulties obstruct the introduction of the intended alteration in the separate branches of woven materials, and by what means can they be removed?
6. What means are to be employed to carry into practice the improvements which have been deemed worthy of adoption?

APPENDIX B.

No. 1,426.
[TRANSLATION.]

VIENNA UNIVERSAL EXHIBITION, 1873.

GENERAL DIRECTION.

42, Praterstrasse II., Vienna,
14th June 1873.

MR. SECRETARY GENERAL,

VARIOUS inquiries addressed to me as to whether the participation in the forthcoming International Yarn Numbering Reform Congress, which is intended to be held from the 7th to the 12th July, is dependent on a participation in the Exhibition, induce me to request you, Mr. Secretary General, to make it known that such will not be the case; on the contrary, every one who takes an interest in this question, and whose name is communicated to me by you before the 17th instant, will receive from me, in the second half of this month, a ticket entitling him to attend the meetings, and take part in the deliberations of the Congress.

Receive, Mr. Secretary General, on this occasion, the renewal of the expression of my high esteem.

(Signed) SCHWARZ-SENBORN.

Mr. P. Cunliffe Owen, Secretary General of the
Exhibition Commission for Great Britain.

APPENDIX C.

[TRANSLATION.]

VIENNA UNIVERSAL EXHIBITION, 1873.

UNIFORM NUMBERING OF YARN.

His Excellency Baron von SCHWARZ-SENBORN, Director General of the Vienna Universal Exhibition.

I HAVE the honour, as an Exhibitor with the firm Pasquay frères & Cie., to submit to you herewith some observations which are based upon many years' experience with reference to the question mentioned in your programme of the 10th July 1872, relative to the Congress to be held at Vienna this year for the purpose of discussing the advisability of introducing a uniform system of numbering of yarn.

Disadvantages of the different systems of numbering.

The disadvantages of the present state of affairs are so patent to every man of business, and so onerous, that it is scarcely necessary to dilate upon it. It is, unfortunately, too notorious that there is in the various countries for each sort of yarn, not only a separate standard (*i.e.* grist) in existence, but that in the same country there are even several modes of numbering the same sort of yarn in use.

Yards—French, Leipsic, Brabant, Vienna, Berlin, and Würtemberg ells and meters—English, Austrian, and Customs pounds—kilograms along with old French grains—form just as many foundations of the polyglot expressions and idioms which a man of business has to learn in order to be able to master all these variations.

In some measure France, where the metrical system of weight and measure, with decimal division, has been the longest time in existence, serves as a guide, since there are for carded yarns, besides the kilogram-metrical system, other systems in use which are based, partly on the ell measure of 1·19 m. or 52 Parisian inches, and the half kilogram, besides the "Livre de table" of Southern France.

Linen yarn is marked there in English yards and pounds, silk in *aunes* of 1·19 m. and grains of 0·053 gr. For worsted yarn 720 meter in one place and 714 meter in another, form the unit of length, with 0·500 kil. and also 1 kil. as unit of weight.

The number denotes the degree of fineness of the yarn, and is the exponent of the proportion of the length to the weight.

A rational system of numbering.

There can be only one rational system of numbering, for all countries in which the meter and kilogram systems have been introduced, or where their introduction is in prospect, namely, that by which the number expresses the proportion of the length in meters to the weight in grams, and respectively of kilometers to kilograms, so that a yarn, of which—

1,000 meters length weigh 1,000 grams, would be marked by No. 1.

500 meters length weigh 1,000 grams, would be marked by 0·5 or 500 m m.

1,200 meters length weigh 1,000 grams, would be marked by 1·2 or 1,200 m k.

24,500 meters length weigh 1,000 grams, would be marked by 24·5.

50,000 meters length weigh 1,000 grams, would be marked by 50.

This system, the kilogrammetrical, is already partly in use; for example, for carded yarns at Rheims and in Alsace, and also for silk waste yarns, floss, and burling silk, &c.

The French cotton standard is also based on the kilometer and the half-kilogram, as, by an unpardonable mistake, it was prescribed in the "Ordonnance royale" of the 26th May 1819, that is, long after the legal introduction of the kilogram as unit of weight.

The change into the kilogrammetrical system presents here no difficulties.

As the metrical system of weight and measure is already in use in the most important countries of the continent, and will most probably be introduced very soon into all the others as well, no other system of numbering yarn but this can lay claim to be adopted by all those collectively who are interested in the subject, since this system perfectly agrees with the new system of weights and measures, and also with the decimal system.

I lay stress upon the word "perfectly" in order to exclude at the beginning any later attempts at improvement, and to caution against half or so-called transitory measures, as unfortunately have also crept into the law of 17th August 1868, passed for regulating the weight and measure in the German empire, namely, in the form of the "Zentner" (hundredweight) of 50 kilograms, and the "Scheffel" (bushel) of 50 liters, which do not allow of being arranged in a decimal scale of kilograms and liters.

When thus much has been accomplished, the intelligent portion of the public will improve and complete it, each one in his own way, and we see already commercial centres taxing the goods per "Zentner" (hundredweight) of 100 kilograms and hectoliters, whilst others follow the erroneous standards of the Imperial law, and so forego the advantages of decimal calculation.

Making up.

But with the introduction of a uniform international system of numbering, the question is only half solved, for far more disturbing for trade is the great difference in the making up or reeling of the yarns.

Even if the numbering has been placed on a proper footing, a yarn scale (Romaine) which gives on the scale of the quadrant the new number, if 1,000 or 100 meters of the yarns to be tested are hung upon it, can be of service only in case the yarn has been reeled and tied under per 100 meter length.

For this reason the purchaser of yarns asks for those most advantageously made up for him, in order that he may not have to receive from various places of production hanks of all sorts of length, which require just as many standard scales, if not re-reeling or tedious calculations, and cannot always in spooling off fit on the bobbin wheel (reels) on hand.

Nor does the spinner, as a matter of course, find a ready sale in every market for the goods on hand, and he must often keep them in stock in order to prepare the yarns reeled as ordered.

In order to achieve a uniform making up (reeling) and to maintain in connexion with this the proposed kilogrammetrical system of numbering, the thread length of the hanks must also consist of a round decimal meter number, for example, 1,000 meter in hanks of 100 meters each.

In practice the coarser yarns might, without detriment to the carrying out of the system, be delivered in hanks of more or less than 100 meters in length.

The diameter of the reel I propose to be 1.50 m., since here also, in order to facilitate the general adoption as much as possible, a round number is required. Moreover, this measure deviates very little from the dimensions in general use, and it is easy to adapt the diameter of the existing reels to correspond with the new measure by fixing on them thin laths or cardboard.

Experience has also taught me that hanks of 1½ meter size are easily introduced everywhere, and our firm has supplied this making up for 15 years, to Paris, Lyons, and Normandy, as well as to Berlin, Vienna, Silesia, and the Rhenish countries.

With 66 windings per hank the length will be 99 meters theoretically; actually, however, invariably 100 meters, and on account of the gradual increase of the diameter of the reel, even more than 100 meters.

A theoretically correct standard of the spooled length, moreover, cannot possibly be uniformly maintained, as the same reel is always liable to produce deviations by the greater or less straining of the thread, according to the fineness of the yarn.

For coarse jute and Phormium yarns a larger diameter of reel might perhaps be recommended, but the divisions of the hanks must absolutely agree with the decimal division of the kilometer, and the uniform system of numbering the yarn must also be applied to these yarns.

Legal compulsion. In order to carry speedily and surely a uniform system of numbering into practice, it is recommended to make its application compulsory by law, for even if the importance of such a uniform numbering for their inland and foreign trade is apparent to the intelligent portion of manufacturers, it is to be apprehended that for about ten years or more the old methods would still be adhered to in some countries.

We must not leave out of our calculations that in Prussia, even today, oily carded yarn is sold by the old Cologne Zentner, but when washed the same sort of yarn is sold by the "Zoll Zentner;" and in France, more particularly in Paris, after the new system of measure and weight has been legally introduced for nearly a century, units of weight, owing to the imperfect application of that law, are made use of in the wholesale trade which have not the slightest relation to the kilogram and its decimal division.

Briefly summarized, the above remarks and propositions may be formulated into the following principles, which must be taken as a basis for an international system of numbering yarn, in order to meet with general adoption:—

1. Complete agreement with the latest system of weights and measures.
2. That the number shall represent the proportion of the length in meters to the weight in grams, and respectively of the kilometers to the kilograms.
3. Making up by means of the adoption of a uniform reel of 1½ meter diameter; hanks of 66 lengths virtually equal to 100 meters.

Wasselnheim in Alsace, November 1872.

(Signed) FRITZ PASQUAY,
Of the firm Pasquay frères & Cie,
Carded yarn and silk factory.

APPENDIX D.

[TRANSLATION.]

EXTRACT from the REPORT of the CHAMBER of COMMERCE at Mühlhausen, on the Question of a UNIFORM NUMBERING of YARN.*

The Chamber of Commerce of Mühlhausen, prompted by the preparatory labours of the Vienna Commission, has applied to the Industrial Association of the town to deliver an opinion, which is made public in the present document.

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* This report, drawn up with excellent scientific clearness, but which is unfortunately too voluminous to admit of its being reproduced here *in extenso*, is published by Wittwe Bader & Co., of Mühlhausen.

The two forms in which yarns appear are the bobbins and the skeins. The former are sold according to weight, the latter both according to length as well as to weight. But it is always the proportion between weight and length which determines the numbering.

Now, whilst as regards silk, the numbering is determined by the number of unities of weight (deniers) which are contained in a certain length (new 500, old 475⅝ meters), the contrary system is almost everywhere in exclusive use with all other textile fabrics, cotton, sheep's wool, flax, &c. Accordingly a certain number of unities of length, yards, meters, &c., is fixed upon as a standard, and the numbers are designated according to the number of those combined lengths called skeins, which is contained in a certain unity of weight, in a pound, or a half, or an entire kilogram. In practice the sorting-scale (Romaine) is used for determining the number of a yarn.

It will be seen, in comparing the two methods, that with silk the finer the thread the lower is the number, whereas, according to the other method, the number increases with the fineness. The adoption of the first method would upset old usages, and offer no real advantage. Neither does it appear possible to alter the method which serves as a basis for the numbering of the greater part of the textile fabrics, and is justified by long custom. We accordingly affirm that whatever system of numbering may be adopted, it must be based on the number of unities of length which is contained in a unity of weight, and not *vice versâ.*

The systems of numbering yarn have, for the most part, remained unaffected by the changes which the weights and measures of different countries have been subject to, partly by legal enactments, partly by practical requirements. In like manner, just as these systems of numbering differ, not only according to fabrics, but also according to the countries, and even frequently differ in various towns; neither do they in many cases conform in any way to the weights and measures in use in the countries in question. Now, the same reasons which have brought about an alteration in the system of weights and measures must in like manner reform the existing systems of numbering. We therefore affirm that it is urgently necessary to place the system of numbering yarns in exact corresponding connexion with the system of weights and measures, and to seek a uniform system for all textile fabrics. The metrical system being, by reason of its extreme simpleness, best adapted to be extended everywhere, it is necessary that the numbering be in conformity therewith. However, it appears necessary not to lose sight of the fact that, in adapting the new system of numbering to the metrical system, it should in its application approach as near as possible to that which is in use at the present time, that is to say, that the lengths of thread and the bulk of the skeins should differ as little as possible from the dimensions which are at present in use in the various textile industries.

In regard to cotton there is, besides the English system, which is neither metrical nor decimal, the French system, which is based on a metrico-decimal system, but has nevertheless been approximated as nearly as possible to the English numbering, when introduced. For this reason the half-kilogram was taken as a unity of weight instead of the kilogram, and this admits of a very easy calculation from one system into the other, the numbers being in tolerably exact proportion, as five to six. A few and insignificant alterations of the mechanical contrivances were necessary at the introduction of the new system in France, and it may be owing to this that it has not remained a dead letter for commerce and industry. Moreover, this system has the advantage that with yarn in bundles, the bundle weighing 5 kilograms, the number of plaits (Docken) at 10 skeins contained in one bundle, represents at the same time the number of the yarn.

Although the system of numbering which has the kilogram for its basis, is in many respects more advantageous, especially in reducing the quantities to their weight, it still differs all the more from the systems principally in use, and one must consider whether the advantage referred to is of sufficient importance not to accept an already prevailing system which is sanctioned by experience, and is in use in a country which is of great importance in industrial production. It has also been proposed to replace the horse-power of 75 kilogram-meters by the unity of 100 kilogram-meters, with the appellation DYNE. This, however, has been a complete failure.

To the objection that the circumference of the reel at 1·4285 represents an insufficiently round number, we reply that it approximates the nearest to the English reel, and is in practice for different reasons reduced to a simpler number, viz., 1·42. The circumference of the reel at 1·5 meters would give no correct number of complete revolutions in order to get 10 hanks to 100 meters. The circumference of 1·25 meters would make the skeins too thick, according to past experience, and considerably increase the work done by hand for the coarse numbers.

All these reasons induce us to propose the adoption of the French system of numbering for cotton, because it is based upon the metrical system, and would only require unimportant alterations in the contrivances used in the English system, and because it does not create any new difficulty for the industrial modes of manipulation.

Meanwhile, if the adoption of the entire kilogram as basis of the new system should tend to the union of a greater number of adherents, or if it should offer important facilities for other textile fabrics, we should not consider this alteration to present any material obstacle, inasmuch as only the designation of the numbers would have to be marked doubly as high in consequence.

In adopting the numbering proposed by us, the skein would be a little longer and thicker in worsted yarn than it is in France according to the present numbering. This, however, would not cause any difficulty in industrial operations, because still greater thickness of the skeins is found in carded yarn, which is subjected to the same process as worsted yarn.

With carded yarn, for which different methods of numbering prevail in France, our mode of numbering would form about a medium standard between them, and the extent of the numbers which would fall generally between No. 5 and No. 160 would meet all the requirements of the wool industry.

For linen, *i.e.*, flax, the half-kilogram is already the standard unity of weight of numbering. As a greater length of reel appears to be an advantage in practice, we suggest, in conformity with the proposition of the preparatory Committee, the adoption of 2·50 meters as circumference of reel, and also for hemp and jute. Floss-silk would likewise adapt itself without any difficulty to the new mode of numbering.

With silk, the great obstacle to the adoption of the new system could only consist in the usages of commerce and industry to number in the contrary way to that which we suggest. But if it is intended to effect a uniform numbering for all textile fabrics, it is necessary that this radical change be accomplished.

All these considerations lead us to the conclusion to propose as a uniform system of numbering for all textile fabrics, the one in accordance with which cotton is at present numbered in France. The number of skeins of 1,000 meters in length which is required in order to obtain the weight of 500 grams, will give the number of the yarn. The hank will be made up by 70 turns of the reel, and 10 hanks will make one skein. The theoretical circumference of 1·4285 is applied to cotton, worsted yarn, carded yarn, floss-silk, and raw silk. For linen, *i.e.*, flax, hemp, and jute, the theoretical circumference of reel of 2·50 meters is adopted; in this case 40 turns of the reel will make the hank, and 400 the skein.

If the entire kilogram should be absolutely necessary, in order to obtain adherents to a uniform system, we should see no material obstacle in it, and accommodate ourselves to its acceptance, without, however, recommending it, on account of the reasons stated above.

We find no alterations of any description admissible for carrying out this system; the reasons which could be advanced against the introduction do not appear to be in any way tenable.

The most efficacious means of effecting uniformity appear to us to be the co-operation of the chambers of commerce, of trade corporations, and industrial societies, the circulation of comparative tables, and the construction of comparative sorting-scales. But it must not be forgotten that deep-rooted customs, and perhaps very powerful interests, will have to be contended against. A direct effect of the proceedings of the Congress is to be expected only in those countries which already possess the metrical system. But this is no reason why the attempt should not be made. These countries are at present numerous enough in order to draw the others with them hereafter by the force of facts. It is true that England, the most industrial country, does not yet possess the metrical system, and thence will arise the great difficulty against the introduction of general uniformity.

However, a statutory enactment could speedily remove certain anomalies still prevailing in the yarn trade. In altering weights and measures the law has forbidden the use of the old systems after the expiration of a certain time. Shall we not also propose an analogous procedure in regard to the numbering of yarns? We believe we cannot be reproached for advocating repressive measures, when the advice of the parties concerned has been previously obtained, and their objections have been taken into account.

On behalf of the Mechanical Committee,
(Signed) CAMILLE SCHÖN,
Reporter.

The suggestions contained in the foregoing report have been approved by the Industrial Association of Mühlhausen.

(Signed) AUGUST DOLLFUSS,
President.

The Chamber of Commerce has approved the foregoing report at its meeting this day. Mühlhausen, 16th April 1873.

(Signed) J. ALBERT SCHLUMBERGER,
President.

APPENDIX E.

No. 77.

[TRANSLATION.]

VIENNA UNIVERSAL EXHIBITION, 1873.

INTERNATIONAL CONGRESS FOR DISCUSSING THE QUESTION OF A UNIFORM NUMBERING OF YARN.

PROPOSITIONS.

In accordance with Programme No. 61, dated July 10, 1872, paragraph 4, the preparatory Committee suggests that the Congress should discuss and resolve upon the following propositions:—

I. The present systems of numbering yarn obstruct the trade in woven textures, and subject it to great inconvenience. Considering that yarn has become a staple article of international commerce, which is being continually developed by commercial treaties, new railway enterprises, telegraph constructions, and international exhibitions, it is in the highest degree desirable that the removal of every acknowledged obstacle should be strenuously supported.

The present time appears to be the most opportune period for that purpose, as the use of the metrical weights and measures system, adopted already by many States, has lately been extended to an industrial territory comprising 70,000,000 inhabitants.

II. It appears that if the choice of the standard of weights and measures be made to correspond with the nature of the web, it is possible to effect a numbering of all textures on the same principle.

III. The principle of this uniform numbering recommends itself in the following way:—The number will be determined by the number of meters weighing a gram, a decagram, a hectogram, or a kilogram. Considering that the standards of yarn in trade are independent of the principle of numbering, and that in establishing the standards, technical circumstances are to be considered, the various textures will be brought into the market, as heretofore, partly according to measure of length and partly according to weight.

IV. With respect to the reel-length, the following is to be recommended:—

(*a*.) For flax and jute, 2½ meters;
(*b*.) For combed, carded, silk and cotton yarns, 1½ meter.

V. The mechanical alterations in the machinery consequent on the introduction of this new system of numbering are very trifling. They comprise the adoption of new sorting balances, and a new reel. The cost of these, as well as labour, are nothing in proportion to the immense advantage to be derived by the change.

VI. In order that the new system may be effectually carried out, the resolutions of the Congress should be circulated through the press, the co-operation of industrial Societies, Chambers of Commerce, mercantile communities and associations, its quotation in usances, and lastly, by legal measures to be secured. The most effectual means to be employed, however, is the voluntary introduction by the spinners themselves.

An International Committee of at least seven members will be selected from the Congress, who will meet at least once a year from 1874, in order to ascertain what has already been performed, and further to provide measures which may appear desirable.

EXPLANATIONS AND ARGUMENTS AS TO PROPOSITION I.

There are works written giving an account of the coinage, weights and measures systems of the several States, and the same works generally devote a large space to the numbering of yarn; there are also special books treating upon this matter, as the subject is too extensive to be treated in a restricted form, especially if every kind of yarn is considered. Weaving schools, if they treat only of a part of the rich material, must lose a great deal of time in teaching. Very few manufacturers or merchants are capable of completely controlling the subject, for only a superficial observation will illustrate the long row of figures which have to be dealt with. In cotton yarn, for instance, there exist two systems of numbering; England has, for a uniform weight, the English lb., and length, 840 yards; France has, for uniform rate, the ½ kilogram and length, 1,000 meters (hanks). In combed wool Germany always calculates 840 yards to an old Berlin lb.; England, 560 yards to the English lb.; France, 720 meters to 500 grams. For flax yarn the bases of fineness are:—1,152,000 Silesian yards to 2,400 Prussian lb.; 60,000 yards to 200 English lbs. 36,000 yards to 540 kilogram. In carded wool the standard length are:—1,493,624 and 3,600 metres, 800 and 1,200 Saxon, 2,200 and 2,240 Berlin ells, 1,760 Vienna ells, and the standards of weight, the English, old Prussian, Saxon, Customs, and Vienna lb. Floss silk is wound up according to the English and metrical systems, &c.

To this must be added that the standards of sorts brought into market are differently composed for the various threads, and that the divisions and subdivisions show the greatest variety of numbers in their mutual relations.

From a glance at this hasty sketch alone it may be inferred that no further illustration is needed to prove that these differences must create disorder in commerce. Indeed, it is considered troublesome to all interested in the matter, as every one is sensible not only of the injurious consequences which the manifold systems of coinage, weights and measures always occasion, but also that the ciphers of the numbers do not agree with the thickness of the thread: that an equivalent for the number of yarn of one system is hardly to be found in another; that a change is therefore required in the setting of the web when a different, *i.e.* substituted, number is used; that a comparison of prices is rendered difficult if not impossible; that buyers are hindered from examining the correctness of the numbers of the yarn purchased, and have therefore to accept it on good faith; in short, the differences in marking the thickness of thread of the same spinning fibre within the same industrial territory, cause more or less material inconveniences in the appropriation, calculation, and manipulation, complicate the unavoidable technicalities, and render trade in it difficult. It ought not to be overlooked that without taking the necessary increase of machinery into account, the weaver of mixed material will be able, only by the assistance of a series of reciprocal ciphers and calculations arising therefrom, to calculate from the weight and number the length of yarn required, and from this, and also from the number and thickness of the thread, the weight of the standard of surface. These difficulties are, if possible, increased by the necessity arising in cases of litigation, as the judges as well as the parties concerned are obliged to make deep researches in order to establish a ground for judgment. We would also allude to the circumstances that the practice of numbering introduced in several countries is founded on a system of measures and weights not used in the other trades with which they are in business relations.

By reason of this the simplifying of the system of numbering yarn appears to be most urgently needed, from a technical as well as from a commercial point of view. The actual moment shows this necessity to be the more stringent, as the change which has taken place in the legal system of weights and measures of a powerful industrial and commercial State will essentially favour the desired change. Apart from the alteration of antiquated ideas and the greater susceptibility to innovations which will be occasioned by this in Austria, Hungary, and Germany, there is also the circumstance in favour of the question of numbering yarn being brought now to a solution, as the imminent introduction of the metrical system of weights and measures, as the only legal one, would, if the present system of numbering yarn should be continued, have this result, as a consequence, that yarns would be bought and sold on this large area according to one system, and be numbered according to another entirely different in its foundations, which would doubtless produce a division of opinions and even a complete confusion.

AS TO PROPOSITIONS II. AND III.

In considering the question of the numbering of yarn, the principle must be strictly kept apart from the question as to which system (weights or lengths), and according to what standard of numbering yarn is to be brought into commerce. The difference in weight which many materials suffer in consequence of the conversion into yarn by intermixing with other material, or which occurs to other materials in consequence of their great affinity to the moisture of the atmosphere, determine in effect that certain kinds of yarn are only dealt with in commerce according to length, while others are only dealt with according to weight.

The compatibility of these twofold measures in use in commerce with the existing principle of numbering common to both yarns, or which is quite the same, the independence of both instances from one another, appears from the existing circumstances, as shown by the present trade in yarn. With the exception of silk, there at present already exists for all spinning material one system of numbering, the formula of which says:—"The yarn number is given by the numeral, which shows how often a certain length of yarn corresponds with a certain weight." Opposed to this general principle of numbering we see that the flax spinner sells his yarn according to length; the cotton spinner, on the other hand, sells according to weight, notwithstanding that the calculation of the spinners of both spinning material is founded upon the weight, whereas the weaver of both materials calculates by the length of yarn, and that the price of each of these descriptions of webbing is arranged according to the number.

Experience proves that it is not this deviation which burdens the international commerce in yarn, but it is, apart from the difference in the coinage system, the inequality of the system of measurement, referring to weight as well as length, the variety of subdivisions and of the principles of formation, on which they rest, and lastly, the great number of transmutation numerals which embarrass commerce and produce the above-mentioned defects.

As a substantial relief, the yarn trade has therefore to welcome the period when all industrial territories shall exclusively employ the metrical system of lengths and weights, and the subdivisions framed according to the decimal system.

As an instance, the following division of the reckoning quantities in linen yarn will suffice, namely:—

1 shock = 10 packets, at 10 pieces, at 10 hanks, at 10 skeins, at 10 lea, at 10 threads, at 1 meter; or, in another form:—

1 gross = 1,000,000 meters.
1 packet = 100,000 „
1 piece = 10,000 „
1 hank = 1,000 „
1 skein = 100 „
1 lea = 10 „
1 thread = 1 „

This essential relief will not, under the below-specified and further developed conditions, interfere with any other yarns at present in use.

However praiseworthy the measure may be, yet it appears that the aim imagined by this work will not be yet accomplished through it. In opposition to the ruling difference of the parting points, the adoption of one fundamental principle common to all yarns and generally adhered to should be attempted.

As the number of yarn is the result of only two elements—length and weight—so in general only two principles of numbering are possible:—

1. The number of yarn is equal to the number of standard weights, which are contained in a thread of a certain length.
2. The number of yarn is equal to the number of standard lengths which correspond to a certain weight.

It is evident that the question which of the two principles should be chosen, can only be answered from the point of view of opportunity. It will therefore have to be examined which of these will be acceptable to and prove most profitable for the spinner, yarn merchant, or weaver, being the parties most interested in it; the first, which assumes—to use other words instead of the above formula—"the length as steady and the weight as variable," as for instance:—

No. 20 is yarn of which 1,000 meters weigh 20 grams.
100 „ „ „ „ 100 „

or the second, which "combines variable length with fixed weight;" as for instance:—

No. 20 is yarn of which 1 kilogram measures 20 kilometers.
„ 100 „ „ „ 100 „

With the first system it is plain that the number is lowered with the fineness of the yarn, and number and weight stand in direct relation; with the second, on the other hand, the number rises with the fineness of the yarn, and number and weight stand in inverse relation.

It appears when one of the elements is fixed, that is, when one of them in an unchangeable quantity or in decimal division is taken for a basis of the numbering of all spinning yarns, both systems are equal in value. Both systems are easily comprehensible, convenient, and practically appropriate; both render it possible to establish a general system of numbering for all yarns, without including too many high figures or inconvenient fractions, if the standards of weight and length are adapted to the specific peculiarity of the various yarns. In the one case the steady standard weight is, corresponding with the character of the spinning material, represented in gram, deci-, centi-, milli-, deka-, hekto-, and kilogram, and in the other case the steady standard length is represented in meter, deka-, hekto-, kilometer.

Owing to the metrical system the objection that the numbering of the web of very coarse thread stuff cannot be placed with some of the finest material on the same basis, without sensibly damaging the practical requisite of one or other description of web, is refuted in advance. A scope as is here given would completely satisfy the practical requirements of the various descriptions of webbing.

The establishing of any of these systems would render it further possible to find for the number of a spinning material with the same easiness the equivalent number of the other spinning material, as 10 or a higher power of 10, according to the fundamental relations, will form either the factor or divisor. Unquestionably, therefore, one is, without making further examinations, already advanced nearer to the desired object through the indiscriminate selection of one of the two principles. As, however, the question is merely one of utility, it still requires a more penetrating examination as to which of the two principles give greater advantages, and which therefore should have the preference.

If yarn numbers and weights stand in direct relation to each other, then the weight of a certain length of yarn, on which weight depends the quantity of the proper yarn for the production of a web, will be found by multiplying the number of standard lengths with the known weight of the standard lengths upon which the system is founded. Especially by fulfilling the above suppositions, the creation of standards for calculation or trade upon the basis of decimal division, this operation is unquestionably very easy to carry out.

If, therefore, this system of numbering recommends itself unconditionally from the weavers' point of view, it cannot be denied that the other system will meet with a readier approval by spinners and yarn dealers, and even the weaver will find in certain cases this other system more advantageous, as the number corresponds with the figure of standard lengths which are included in the standard weight.

The spinner will find by this system the calculation substantially simplified and relieved.

An analysis of the cost of producing the yarn shows that one part of the same is proportional to the weight, inasmuch as the respective working expenses (cleaning, carding, sorting), for all numbers of yarn remain the same. Another part, on the other hand (slubbing, spinning), increases with the fineness of the yarn, or what is the same, with the increase of the length of thread, the weight remaining the same. A third class of expenses, however (dressing, management, machinery, premises), is to be applied in such proportions as experience will show to length and weight.

The higher the yarn number rises in consequence of the latter principle the more value of labour is represented by the product. The expression in figures of such value is on the base of this principle extraordinarily easy. The cost of production, independent of the number, must accordingly be considered as fixed, and added to the price of the standard of weight of the raw material shows one item in the cost price of the yarn.

As for the later working expenses, occasioned by the conversion into yarn, which are increased in proportion with the fineness of yarn, an average value cipher can be established for each number; it follows therefrom :—

1. That the price of production of certain yarn is to be found in each single instance by a simple addition or subtraction.
2. That the fluctuation of prices of raw material in the same way are easily and safely to be valued in the finished fabric.

A simple addition or subtraction renders it possible, in one word, to ascertain forthwith the expenses for any number, as also the numerical statement of the influence of the price of raw material upon the cost price of the fabric.

On the other hand, if the length is accepted as steady, then the items of account will be altered, as well as their mutual relations, and with these also the mode of calculation. If weight forms the only base of expense calculation, then there will alter with each number, not only the price of labour, as before, but also the value of the material, and in consequence of this alteration, the necessity arises of employing, for each number, at each fluctuation of price of the raw material, a tolerably complicated account.

The spinner as well as the yarn merchant are equally interested, in a rational course of trade, to form an opinion of the cost price of the different yarns, for which purpose an easy and possibly speedy mode of calculation is also of interest to him.

But the weaver also will find, what is easily to be proved, that in the case of buying yarn wound on the spindle this numbering principle will be far preferable. It is also to be admitted that however easy it is to find, in consequence of the fixing of one of the items, the other items in both systems, yet the system denoting the number by the length has still the advantage of an unparalleled simplicity.

One kilogram yarn, No. 36, for instance, without even making a calculation necessary, already expresses a uniform length of yarn of 36 (kilometers, &c.). But to find the length according to the other system, the following calculation must be made:—1,000 meters, No. 36, weigh 36 grams, consequently 1,000 grams measure:—

$$\frac{1{,}000 \times 1{,}000}{36} = 27{\cdot}777 = 27\tfrac{7}{9} \text{ kilometers.}$$

If we consider, lastly, the influence of views received by education, and the not to be under-rated power of habit, the numbering principles existing in practice plead also for the pre-eminence of the system, according to which the number stands with the fineness in direct, but with weight in inverse relations.

AS TO PROPOSITION IV.

On account of the length of the reel for flax and jute being $2\frac{1}{2}$ meters, the calculation quantities will be made up as follows:—

1 skein = 40 reels = 100 meters.
1 hasp = 25 skeins = 2,500 „
1 piece = 4 hasps = 10,000 „
1 pack = 10 pieces = 100,000 „
1 gross = 10 packs = 1,000,000 „

Although this division differs in some respects from the above represented sections, yet it is in perfect harmony with the system. The unimportant difference in weights existing between the old and new numbers for manufacturers can be equalised by slight alterations in the setting. The advantage of such easy calculation is consequently gained with barely a sacrifice.

The length of the hasp of 1 meter for the other yarns will be generally too short for practical purposes; on the other hand, hasps of 2 meters will be too long. Should, however, the length of 1,000 meters be comprised in a precise number of thread and the circumference of the hasp in meters give not a too complicated fraction, then only the numbers of 1,000, 800, 750, 600, and 500 threads, representing a circumference of the hasp of 1, $1\frac{1}{4}$, $1\frac{1}{3}$, $1\frac{2}{3}$, and 2 meters will appear possible, therefore in regard to the above, only the circumferences of the hasps existing between the two limits are to be recommended. The reel of $1\frac{1}{4}$ meter has the advantage that it admits of being exactly expressed in full centimeters, therefore this size, although the circumference of the reel of $1\frac{1}{3}$ meter approaches nearest to the present English cotton reel (corresponding one with the other as 1·371 is to 1·353), and appears consequently absolutely preferable.

The President of the Imperial Commission,
ARCHDUKE RAINER.
The Chief Manager,
BARON DE SCHWARZ-SENBORN.

42, Praterstrasse,
February, 1873, Vienna.

SUPPLEMENT I.

COMMUTATION TABLE showing the principal Numbers of all Webs comprised in the proposed Uniform System of Numbering Yarn, in comparison with the equivalent Numbers of the most important Systems at present in use.

(The blank places fall beyond the limits of fineness.)

A. Numbers according to the New System.	The Numbers of the proposed System given in column A correspond with—																	
	Cotton yarn and floss silk, English.	Cotton and flax yarn, French.	Flax and jute yarn, English.	Flax yarn, Austrian.	Worsted yarn, German.	Worsted yarn, Old French.	Worsted and carded yarn, English.	Carded yarn, Viennese.	Carded yarn, Bohemian.	Carded yarn, Saxonian.	Carded yarn, Berlin.	Carded yarn, Cockerill.	Carded yarn, Sedan.	Carded yarn, Elboeuf.	Silk, Lyons.	Silk, Old French.	Silk, New Italian.	Jute, Scotch.
	The Numbers:—																	
1		0·50	1·65	1·68														29·03
1½		0·75	2·48	2·43														19·3
2		1·00	3·31	3·23														14·5
2½		1·25	4·13	4·04														11·6
3		1·50	4·96	4·85														9·68
4		2·00	6·61	6·47														7·26
5		2·50	8·27	8·08			4·48	2·04	4·13	2·76	1·74	1·67	1·64	0·69				5·81
6		3·00	9·92	9·70			5·31	2·45	4·96	3·31	2·09	2·01	1·97	0·83				4·84
8		4·00	13·2	12·9			7·09	3·26	6·62	4·41	2·79	2·68	2·62	1·11				3·63
10	5·90	5·00	16·5	16·2			8·86	4·08	8·27	5·51	3·49	3·35	3·28	1·39				2·90
12	7·09	6·00	19·8	19·4			10·6	4·90	9·92	6·61	4·19	4·02	3·94	1·67				2·42
15	8·86	7·50	24·8	24·3	9·18	10·4	13·3	6·12	12·4	8·27	5·23	5·02	4·92	2·08				
20	11·8	10·0	33·1	32·3	12·2	13·9	17·7	8·16	16·5	11·0	6·97	6·69	6·56	2·78				
25	14·8	12·5	41·3	40·4	15·2	17·4	22·2	10·2	20·7	13·8	8·71	8·36	8·20	3·47				

Supplement I.—*continued.*

A Numbers according to the New System.	The Numbers of the proposed System given in column A correspond with—																	
	Cotton yarn and floss silk, English.	Cotton and flax yarn, French.	Flax and jute yarn English.	Flax yarn, Austrian.	Worsted yarn, German.	Worsted yarn, Old French.	Worsted and carded yarn, English.	Carded yarn, Viennese.	Carded yarn, Bohemian.	Carded yarn Saxonian.	Carded yarn, Berlin.	Carded yarn, Cockerill.	Carded yarn, Sedan.	Carded yarn, Elbœuf.	Silk, Lyons.	Silk, Old French.	Silk, New Italian.	Jute, Scotch.
	The Numbers :—																	
30	17·7	15·0	49·6	48·5	18·3	20·8	26·6	12·2	24·8	16·5	10·4	10·0	9·83	4·17				
40	23·6	20·0	66·1	64·7	24·3	27·8	35·4	16·3	33·1	22·1	13·9	13·4	13·1	5·56				
50	29·5	25·0	82·7	80·8	30·4	34·7	44·3	20·4	41·3	27·6	17·4	16·7	16·4	6·94				
60	35·4	30·0	99·2	97·0	36·5	41·7	53·1	24·5	49·6	33·1	20·9	20·1	19·7	8·33				
80	47·2	40·0	132	129	48·7	55·6	70·9								118	112	112	
100	59·0	50·0	165	162	60·9	69·4	88·6								94·1	89·6	90·0	
120	70·9	60·0	198	194	73·1	83·3	106								78·5	74·8	75·0	
150	88·6	75·0	248	243	91·3	104	133								62·7	59·7	60·0	
200	118	100	331	323											47·1	44·8	45·0	
250	148	125													37·7	35·8	36·0	
300	177	150													31·4	29·9	30·0	
400	236	200													23·5	22·4	22·5	
500	295	250													18·8	17·9	18·0	
600		300													15·7	14·9	15·0	
800															11·8	11·2	11·2	
1,000															9·41	9·00	9·00	

The numbers given under A coincide with the French system for floss silk and combed yarn, which is also observable in column 6, next page.
For instance: With which number of the new system does Cockerill's number 10 carded yarn correspond?
To find this we must proceed down this column to number 10, then to the right across to column carded yarn Cockerill in which on the same line number 3·35 will be found.

SUPPLEMENT II.

COMMUTATION TABLE showing the most important Numbers comprised in the System of Numbering Yarn at present more particularly in use, in comparison with the equivalent Numbers of the proposed New System.

(The blank places fall beyond the limits of fineness.)

B. Number according to the present Systems	The Numbers of the present System given in column B correspond with—																		
	Cotton yarn and floss silk, English.	Cotton and flax yarn, French.	Flax and jute yarn, English.	Flax yarn, Austrian.	Worsted yarn, German.	Official worsted yarn and floss silk, French.	Worsted yarn, Old French.	Worsted and carded yarn, English.	Carded yarn, Viennese.	Carded yarn, Bohemian.	Carded yarn, Saxonian.	Carded yarn, Berlin.	Carded yarn, Cockerill.	Carded yarn, Sedan.	Carded yarn, Elboeuf.	Silk, Lyons.	Silk, Old French.	Silk, New Italian.	Jute, Scotch.
	The proposed or Now System of numbering.																		
1		2·00	0·60	0·62											7·20				
2		4·00	1·21	1·23								5·74	5·98	6·10	14·4				14·5
4		8·00	2·42	2·47					9·80		7·26	11·5	12·0	12·2	28·8				7·26
6	10·2	12·0	3·63	3·71					14·7	7·25	10·9	17·2	17·9	18·3	43·2				4·84
8	13·5	16·0	4·84	4·95				9·03	19·6	9·67	14·5	22·9	23·9	24·4	57·6	1177	1120	1125	3·63
10	16·9	20·0	6·05	6·18	16·4		14·4	11·3	24·5	12·1	18·1	28·7	29·9	30·5	72·0	941	896	900	2·90
12	20·3	24·0	7·26	7·42	19·7		17·3	13·5	29·4	14·5	21·8	34·4	35·9	36·6		785	747	750	2·42
14	23·7	28·0	8·47	8·66	23·0		20·2	15·8	34·3	16·9	25·4	40·1	41·8	42·7		672	640	643	2·07
16	27·1	32·0	9·68	9·89	26·3	16·0	23·0	18·1	39·2	19·3	29·0	45·9	47·8	48·8		588	560	563	1·81
18	30·5	36·0	10·9	11·1	29·6	18·0	25·9	20·3	44·4	21·8	32·6	51·6	53·8	54·9		523	498	500	1·61
20	33·8	40·0	12·1	12·4	32·9	20·0	28·8	22·6	49·0	24·2	36·3	57·4	59·8	61·0		471	448	450	1·45
24	40·6	48·0	14·5	14·8	39·5	24·0	34·6	27·1	58·8	29·0	43·5	68·8	71·8	73·2		392	373	375	1·21
28	47·4	56·0	16·9	17·3	46·1	28·0	40·3	31·6	63·6	33·9	50·8					336	320	321	1·04
32	54·1	64·0	19·4	19·8	52·6	32·	46·1	36·1		38·7	58·1					294	280	281	0·91

Supplement II.—*continued.*

B. Numbers according to the present Systems.	The Numbers of the present System given in column B correspond with—																		
	Cotton yarn and floss silk, English.	Cotton and flax yarn, French.	Flax and jute yarn, English.	Flax yarn, Austrian.	Worsted yarn, German.	Official worsted yarn and floss silk, French.	Worsted yarn, Old French.	Worsted and carded yarn, English.	Carded yarn, Viennese.	Carded yarn, Bohemian.	Carded yarn, Saxonian.	Carded yarn, Berlin.	Carded yarn, Cockerill.	Carded yarn, Sedan.	Carded yarn, Elboeuf.	Silk, Lyons.	Silk, Old French.	Silk, New Italian.	Jute, Scotch.
	The proposed or new System of numbering.																		
36	60·9	72·0	21·8	22·3	59·2	36·0	51·8	40·6		43·6	65·3					261	249	250	0·81
40	67·7	80·0	24·2	24·7	65·8	40·0	57·6	45·2		48·4	72·6					235	224	225	0·73
50	84·7	100	30·2	30·9	82·2	50·0	72·0	56·4		60·5						188	179	180	0·58
60	102	120	36·3	37·1	98·7	60·0	86·4	67·7		72·6						157	149	150	
70	119	140	42·3	43·3	115	70·0	101	79·0								134	128	120	
80	135	160	48·4	49·5	132	80·0	115	90·3								118	112	112	
90	152	180	54·4	55·7		90·0	130	102								105	99·6	100	
100	169	200	60·5	61·8		100		113								94·1	89·6	90·0	
120	203	240	72·6	74·2		120		135								78·5	74·7	75·0	
140	237	280	84·7	86·6		140													
160	270	320	96·8	98·9															
180	304	360	109	111															
200	338	400	121	124															
300	508	600	181	186															

For instance: Which number of the new system corresponds with the number 40 of English flax yarn?
To find this, we must search in column B. for the number 40, and then proceed to the right to column 3, where will be found 24·2.

SUPPLEMENT III.

SYNOPSIS of the most notable SYSTEMS of NUMBERING YARN at present in use.

I. COTTON YARN.

1. English (in use over the whole of Europe and North America) number = to the quantity of skeins of 840 yards, which equal 1 lb. English. The English lb. is the selling standard. The reel 1½ yard.

2. French (in use in France) number = the quantity in kilometers, which equal ½ kilogram. Selling standard ½ kilogram. The reel 1·42857 meters (70 threads to 100 meters).

II. FLAX YARN.

3. English (in use in Great Britain, Germany, parts of France and Belgium) number = the quantity in leas, at 300 yards to 1 lb. English. The gross at 12 bundles, at 60,000 yards = 270,000 yards for selling standard. The reel 3 yards in England, and 2½ yards in Scotland and Germany.

4. French (in France and partly in Belgium) number = the quantity in kilometers, which equal ½ kilogram. Selling standard, the gross, at I0 bundles, at 50 kilometers = 500,000 meters. The reel 2½ meters.

5. Austrian (only used in Austria) number = the quantity in hanks, about 3,660 Vienna ells, which equal 10 lb. English = 8·1 lb. Vienna. The shock at 864,000 ells for selling standard. The reel 3 ells.

III. WORSTED YARN.

6. German (used in Germany, Austria, and partly in France) number = the quantity of skeins of 840 English yards, which equal 1 Berlin old commercial pound. Selling standard, the pack at 10 Berlin pounds. The reel 1½ yard.

7. French, old (almost exclusively used in France, Belgium, French Switzerland, Italy, and Spain), number = the quantity of hanks, at 720 meters, which equal 500 grams. Selling standard, the pack of 5 kilograms. The reel 1·44 meters.

8. French, official (seldom used) number = the quantity of 1,000 meters to 1 kilogram.

9. English (in use in Great Britain and the weft spinning mills of the Continent) number = the quantity of skeins at 560 yards to 1 lb. English. Selling standard, 1 lb. The reel 1, 1½, and 2 yards.

IV. CARDED YARN.

10. Vienna (in use over nearly the whole of Austria) number = the quantity of hanks at 1,760 Vienna ells, which equal 1 lb. Vienna. The Vienna lb. for selling standard. The reel, 2 Vienna ells.

11. Bohemian (in use in only a part of Bohemia) number = the quantity of hanks at 800 Leipsic ells to 1 lb. English. The English pound for selling standard. The reel 2 Leipsic ells.

12. Saxon (in use in only a part of Saxony) number = the quantity of hanks at 1,200 Leipsic ells to 1 lb. English. The English lb. for selling standard. The reel 3 Leipsic ells.

13. Berlin (together with the following, in Germany and Belgium) number = the quantity of hanks at 2,150 Berlin ells to 1 Customs lb. The Customs lb. for selling standard. The reel 2½ Berlin ells.

14. Cockerills (used together with the foregoing in Belgium and Germany) number = the quantity of hanks at 2,240 Berlin ells to 1 Customs lb. The Customs lb. for selling standard. The reel 4 Berlin ells.

15. English (in use in England and Scotland) number = the quantity of hanks about 560 yards to 1 lb. English. The English lb. for selling standard. The reel 1 yard.

16. Sedan (in use in France, together with the following) number = the quantity in hanks at 1,256 *aunes* to 1 old Paris lb. For selling standard the Paris lb., as well as the ½ kilogram. The reel 1·2975 *aunes*.

17. Elbœuf (in use in France together with the foregoing) number = the quantity in hanks at 3,600 meters to ½ kilogram. For selling standard the ½ kilogram. The reel 2 meters.

V. SILK (raw silk, organzine and trams).

18. Lyons (new style; in use in Lyons) number = the quantity of grains of the old Parisian market weight to a hank of 500 meters. The weights of the country for selling. The reel variable.

19. French, old (old standard in use, however, in France), number (Denier) = weight in grains to a hank of 476 meters (formerly 400 *aunes* = 475⅝ meters). The selling standard and reel according to the preceding.

20. Italian, new (in use in Italy, together with the preceding), number = the weights in ½ decigrams to a lea of 450 meters. Selling standard and reel as above.

VI. FLOSS SILK.

21. English (in use in England and partly on the Continent). The same numbering as for English cotton yarn.

22. French (in use in France, Austria, &c.) number = the quantity of meters to 1 gram.

VII. JUTE.

23. English (in use in Great Britain and Germany) number = the quantity in leas at 300 yards to 1 lb. English.

24. Scotch (only partly in use in the spinning manufactories) number = the weight of a spindle of 48 leas, therefore 14,400 yards in English lb.

REDUCTION of the existing WEIGHTS and MEASURES to the METRICAL SYSTEM.

1 Vienna lb. - -	=	560·01 grams.
1 Customs lb.- -	=	500·00 „
1 English lb. - -	=	453·59 „
1 Berlin commercial lb.	=	467·71 „
1 Paris lb. - -	=	489·51 „
1 Grain - -	=	0·053115 „
1 Vienna ell - -	=	0·77921 meters.
1 Paris *aune* - -	=	1·18845 „
1 Yard - -	=	0·91438 „
1 Berlin ell - -	=	0·66694 „
1 Leipsic ell - -	=	0·6856 „

PARTICULARS of SPINNING MATERIAL and WEB.

Specific Weight of the Fibre.	Wool 1·26.	Silk 1·30	Cotton 1·48	Flax 1·50	Jute.
Thickness of the fibre in millimeters.	0·078–0·011	0·027–0·014	0·030–0·015	0·023·–0·007	—
Length of the fibre in millimeters.	25–500	—	12·60	320–640	—
Usual numbers existing in commerce.	4–140 (English).	100–9 (French).	6–300 (English).	1–300 (Austrian).	1–18 (English).
Numbers according to the projected plan.	5–160	90–1000 (9–100)	10–500	½–200	0·8–11(8·110

APPENDIX F.

[TRANSLATION.]

VIENNA UNIVERSAL EXHIBITION, 1873.

DRAFT of an ORDER of BUSINESS for the INTERNATIONAL CONGRESS for the DISCUSSION of a UNIFORM YARN NUMERATION.

1. The meetings of the Congress take place regularly from the 7th of July and following days; beginning at 10 o'clock, in the Session Hall of the Lower Austrian Gewerbeverein (Industrial Society).

2 After the address of the official Delegate of the Director General, the first meeting will be opened by the president of the sub-committee, and the election of the president, two vice-presidents, and two secretaries will form the first subject of the order of the day.

3. The election of the members of the permanent Committee, the number of which is reserved for the decision of the Congress, will take place at the close of the last meeting.

4. The divisions and elections are decided by the absolute majority of the votes of the members present.

The elections take place by written votes; those of the members of the permanent Committee require to be signed by the voter. In the same manner the divisions on the motions proposed by the sub-committee, as well as on the resolutions and amendments proposed in the course of the debate, are to be recorded by written votes signed by the respective members.

5. Motions proposed by members of the Congress must be submitted to the president in writing, and, if possible, should be accompanied by a brief summary of arguments.

6. The minutes of the proceedings, which will contain the resolutions in full, but the debates only in an abridged abstract, will be prepared by the secretaries and signed by the president and two other members chosen by the assembly.

7. The official report on the result of the proceedings, and the resolutions of Congress, will be edited and published, according to the verified minutes, by the Delegate of the Director-General.

8. The German language will be used in the proceedings of the Congress; but the English, French, and Italian languages are also allowed to be employed (§ 6 of the General Programme).

APPENDIX G.

[TRANSLATION.]

ADDRESS of the MEETING of FRENCH Millowners and Manufacturers held at the CONSERVATOIRE of SCIENCES and INDUSTRY at PARIS, to the DIRECTOR-GENERAL of the VIENNA UNIVERSAL EXHIBITION of 1873.

MONSIEUR LE BARON, Paris, 30 June 1873.

IN reply to your letter of the 28th April addressed to General Morin, and the circular by which you invited our manufacturers to take part in the International Congress for discussing the question of a uniform numbering of yarn, we have the honour to inform you that a meeting of millowners and manufacturers has taken place at the Conservatoire of Arts and Industry for the purpose of discussing this subject, and determining the proper form in which the opinion of the French manufacturers is to be notified to the Vienna Congress.

The meeting was unanimously of opinion :—

1. That the unification of numbering yarns would be one of the most desirable reforms.
2. That it must be based upon the metrical system.
3. That preference should be given to that system of numbering which makes the numbers correspond with the length of the thread contained in an unalterable and fixed weight, the latter forming, according to the nature of the different fibres, a decimal fraction of the kilogram, and calculated to satisfy all requirements in practice.

The meeting has, moreover, agreed to support any Congress which might undertake to discuss all parts in detail, &c.

These are the resolutions which we are charged to submit to you, with the request to communicate the same to the International Congress.

The Members of the Committee of the Meeting.

(Signed) GENERAL MORIN,
President.
G. ROY.
Vice-President.
L. PERSON,
Secretary.

APPENDIX H.

[TRANSLATION.]

LETTER of the CHAMBER OF COMMERCE at Rheims, to its President M. DAUPHINOT, when delegated to the INTERNATIONAL CONGRESS for the NUMBERING of YARN.

Rheims, 26th June 1873.

MR. PRESIDENT,

You had the goodness to inform us that the Vienna Chamber of Commerce and the Commisson of the Universal Exhibition have appointed an Industrial Congress for the ensuing month of July, in order to deliberate upon the question of a uniform numbering of yarn.

The question is very important for all branches of textile industry. At Rheims, where the manufacture and sale of worsted and carded yarn has been developed for the last 30 years on so broad a basis, the advantages of a reform, which up till now is only partially attained, are duly appreciated. These advantages would be much more considerable if this reform were to embrace not only all the manufactures of France but of the whole world.

The Chamber would deem itself fortunate if you would give your consent to represent the industry of Rheims at this Congress. On one is better acquainted with this question than yourself.

But allow us to remind you that the Chamber of Commerce has already occupied itself repeatedly with the study of the reform, with which it is intended to deal at the present moment.

It was in the year 1838 that a letter, signed by a great number of members of the Industrial Association, and dated 5th March, was addressed to the Chamber with respect to woollen yarns, on account of the non-observance of the decree of 14th December 1810, which prescribes a uniform making up of 1,000 meters for cotton, hemp, linen, *i.e.*, flax and sheep's wool yarns.

The Chamber studied the question, and applied in the month of June to the Minister of Agriculture and Commerce, with the request that he should adopt suitable measures to cause all traders to comply with the decree.

In its letter to the Minister the Chamber first of all explained why the non-observance of the statute had for a long time resulted in no inconvenience, because there was, so to speak, no yarn trade in existence, each factory having spun no more than the quantity of sheep's wool intended for its own requirements. It then showed how business had altered in the meanwhile, and that important transactions in yarn and textures were being effected both on the spot, and by supply to the various manufacturing towns of France. Accordingly the Chamber demanded the application of the statute, laying down the principle that the provision respecting the making up in skeins of 1,000 meters in length was the only rational one, and that in fact, in this case a unity of length would be adopted if recognised as one of the elements of the decimal system, which was also applied to weight, measures of capacity, and coins.

According to the provisions of the decree in question, the making-up is to be effected in skeins of 1,000 meters in length, to be sub-divided into hanks of 100 meters each, according to requirement.

On the 5th December 1839, the Chamber again urged that its request should be granted by the Minister, and lastly made, on the 29th June 1840, renewed efforts in replying to some objections that had been raised.

Later on, it again preferred a complaint, interested the General Council (Conseil Général) in the fulfilment of its wishes, setting forth especially the greater security of business transactions, the improved facility of calculation, the avoidance of misunderstandings, and particularly the prevention and termination of law-suits.

If these endeavours, the exertions of the Industrial Association, and likewise the wishes of the General Council have not penetrated into Government circles, the same ill-success has not been encountered in the domain of facts.

The uniform making-up of hanks of 1,000 metres in length in carded wool yarn was established not long afterwards, and what is more, without exception.

Portions of combed wool yarn is likewise made up uniformly at 1,000 meters. Thus, it is only the worsted yarns in bobbins which have not conformed to this measure, although it is difficult to understand precisely what interests the manufacturers have in persistently keeping aloof from it.

These details, Mr. President, will doubtless appear rather lengthy, yet we ascribe some practical use to them. They will prove, on the other hand, that the Chamber could not remain indifferent to the object which the International Congress at Vienna to-day endeavours to attain without disowning its past exertions. In fact, the object of the Congress is the same which the Chamber has pursued; it is only requisite in addition to extend the measure of uniformity in the making-up of yarn to all the manufacturing countries of the world.

A uniform making-up of yarn, once adopted, will constitute a considerable advance; no one can doubt that.

Let us add, that the measure proves to be very simple if everyone will set aside prejudices, partisanship, and the predilection for established usage.

The sole logical and the sole rational system is that which will express on the basis of the decimal system the number of the yarn by the number of thousands of meters which are contained in one kilogram.

The skein accordingly will be unchangeably of 1,000 meters in length, with subdivisions of 100 meters.

The measure having been once adopted, the various Governments will nave to agree amongst themselves as to make it legally binding in their respective countries.

No exceptions whatever for any description of yarn, of whatever nature it may be, should be admissible, and especially not for carded and combed wool yarns, nor even for bobbins, inasmuch as these can be made to contain just as easily 1,000 meters or a multiple of 1,000 meters.

Our opinion is that you will have to defend the skein of 1,000 meters. To admit other types, the skein of 1,500 meters in kilogram, for example, would signify the running the risk of losing that facility, and that wonderful simpleness of calculation which the decimal system confers, not to speak of other drawbacks.

We hope that the enlightened men of all countries with whom you will have to discuss the question, will possess comprehensive intelligence, both as regards the usefulness of the uniform measure, as in respect of the necessity not to deviate from the decimal system. For the rest, it is not the tendency in our days of all peoples to assimilate all systems of weights, measures, and coins, to the decimal system, a nd the unities of the meter and the kilogram. As regards the uniform making-up of yarns, the difficulty in doing so appears to us to be less than that for weights and coin-currency.

Weights, as soon as deviated from, alter thereby the habits of life of every one. Coins, in order to be altered, involve expenses which nations often shrink from incurring.

In the present case, objections or difficulties of a similar kind are not to be apprehended.

Accept, Mr. President, the renewed assurance of the distinguished sentiments we entertain for you.

For the Members of the Chamber of Commerce.

(Signed) A. MARTEAU,
Vice-President.

APPENDIX I.

LETTER of the INDUSTRIAL ASSOCIATION of RHEIMS, to M. S. DAUPHINOT, Member of the Jury of the Vienna Universal Exhibition.

RESPECTED SIR, Rheims, 26th June 1873.

THE Industrial Association of Rheims, assembled in order to consider the advantages which the adoption of a uniform mode of numbering yarns of all descriptions would offer, has unanimously agreed to the following resolutions, and requests you, Sir, to lay them before the International Congress at Vienna, and to be good enough to support them.

1. The Industrial Association is of opinion that it would be of the utmost importance to adopt a uniform mode of numbering yarns for all countries, and that it would simplify the commercial relations between all States.

2. It considers it to be a natural consequence of the adoption of the metrical system of weights and measures which is constantly coming into very general use, to select the meter as unity of the standard to be adopted; to establish the length of 1,000 meters for the skein for yarns of sheep's wool, as well as of cotton; and to fix the specification of the numbers upon the number of skeins at 1,000 meters contained in one kilogram.

The making-up at 1,000 meters length each is to be recommended, not only because it has its place in the metrical system, but also because in practice, it presents undeniable advantages for the calculation of the material-accounts, and for the composition of the textures.

For the other fibrous materials which cannot be sampled according to 1,000 meters, it is desirable that, whilst the meter remains in all cases the unity of measure, the making-up be always a decimal multiple of it.

The Industrial Association, relying upon the well-known care which you devote to the interests of our town, reckons on your endeavours to obtain recognition of the resolutions above-mentioned.

Very much pleased at being able in this instance to make myself the interpreter of them, I have the honour, Sir, of offering you the assurance of my sentiments of esteem.

(Signed) J. MARTIN RAGOT.
President of the Industrial Association.

APPENDIX K.

EXTRACT from a LETTER addressed by Mr. A HOFFMANN, Vice-President of the Bradford Chamber of Commerce, to DR. MIGERKA, Aulic-Councillor in the Ministry of Commerce at Vienna.

"I very much regret my inability to attend the Congress. As it would consequently be possible, irrespective of my letter, that Bradford may not be represented at the Congress, I take the liberty of communicating to you my *personal* views concerning the unification to be deliberated upon, which, as I know, is shared by most of my colleagues.

"Even if an alteration in the present usage be objected to by many of our spinners and manufacturers, still, on the whole, we desire that the various kinds of length and weight of yarns be reduced to *one* basis.

"The basis of 0·5 kilo appears to me to be the least inconvenient one for all descriptions of worsted and carded yarns, and if it should be adopted for the continent. I hope that we shall succeed in introducing it in England as well.

"In any case you may give the members of the Congress the assurance that we at Bradford should with pleasure and from conviction make every effort in order that a more universal and rational system be realised as soon as possible, and our system replaced by the metrical system."

APPENDIX L.

ABSTRACT of a DEBATE of the CHAMBER OF COMMERCE at GLASGOW on the YARN CONGRESS to be held in 1873 at Vienna.

THE President stated that he had received a letter from the Secretary of the Royal British Commission for the Vienna Universal Exhibition in which the proposal was made to hold a Congress at Vienna for the purpose of introducing a uniform system of numbering yarn. This was a subject of the greatest importance. Whilst the English system of numbering cotton yarns was uniform and familiar to the Continent, it was not the case with woollen yarn, as the same number of woollen yarn would signify various things, according to circumstances, and the places where it is manufactured. Under these circumstances, the proposal made unquestionably deserved the full attention of the Chamber.

Mr. Younger made some remarks in reply to questions concerning the differences which are at present apparent in the numbering of yarn. These differences simply arose from a different unity of measure being employed. No. 1 cotton yarn was such as contained 840 yards to the pound. No. 1 woollen yarn, on the other hand, contained 560 yards, &c. The disadvantages accruing to trade from this difference were very numerous.

In the first place, they led to difficulties and errors in the calculation of the cost of production of the goods. This was especially the case in the manufacture of mixed goods, which were produced at Glasgow in great quantities. Manufacturers often were obliged to alter the materials of which their goods were made, and if they had to make use of new descriptions of yarn which were reeled and numbered in a manner not familiar to them they would lose time, and be liable to mistakes. They were in the habit of either charging too high a price in order to suffer no losses, or too low a one. In the former case they would loss custom, in the latter they would sustain loss by executing unprofitable orders. The sellers of yarn frequently lost much time by having to explain to the manufacturers the proportion between the numbers of different descriptions of yarn, or tables had to be prepared for the same purpose, and reference made to them in case of need. Notwithstanding all these measures of precaution, errors arose. In the second place, it was difficult to test the various descriptions of yarn when they were differently numbered, and the manufacturer was often at a loss concerning the question as to whether he would obtain the degree of fineness in his yarn to which he was entitled. Thirdly, mistakes could occur when it was a question of producing goods which were to be mixed of different materials in certain proportions—for example, wool, cotton, or silk, in order to comply with the requirements of the customs' tariff of foreign states, and not to run the risk of being charged a higher import-duty, and thus driven out of the market, in consequence of an error in the calculation of the respective numbers of the materials to be employed. It was certain that a uniform system of numbering could very well be introduced if all parties interested would only adopt the same unity of measure. The system which prevailed most extensively was the one employed for cotton yarn, and the numbering in use here was not only well known in the United Kingdom, but also in many foreign countries. One of the obstacles which stood in the way of a uniform system of numbering was, undoubtedly, the force of habit, that is to say, long prevailing custom. A practical step towards an advance in this direction would consist in some influential traders engaged in the manufacture of the various descriptions of yarn, meeting and agreeing upon a uniform system of numbering. The representatives of each separate trade could consult amongst themselves as to whether such uniform system could be generally adopted. In any case such a system could only be gradually introduced; but even an approximate uniformity would be a great step in advance. However, it would be difficult to establish a uniform system for different countries. Indeed it was not conceivable how such a system could be established unless a uniform international system of weights and measures were first of all introduced.

The President invited the Chamber to give their support to the Congress to be held at Vienna during the time of the Universal Exhibition, by which this question would be discussed, and to consider whether it would be possible to introduce a uniform, or at least a more simple system of numbering yarn.

Mr. Stephen Mason observed that, in his opinion, the sole inconvenience which would result from a change in the system of numbering yarn would consist in the difficulty of accustoming the workmen to the use of the new one.

After a long debate the Chamber unanimously resolved,—

"That it is desirable that a uniform system of numbering yarn be adopted, and that, as the numbering customary with cotton yarn is the one best known, it could be advantageously applied to other yarns, such as sheep's wool, silk, linen, *i.e.*, flax, and jute."

APPENDIX M.

[TRANSLATION.]

THE undersigned members of the International Congress for introducing a uniform numbering of yarn, representing the branch of carded yarn manufacture, declare herewith their unanimous resolution to accept the length of 1,000 meters per hank, subdivided into 10 leas at 100 meters with a hasp, diameter of 1.50 meters, or five leas of 500 meters.

(Signed) M. E. SCHWARZ (Brünn).
W. TEUBER (Brünn).
C. CENTNER (Verviers).
J. DUCKERTS (Verviers).
SEVERIN FAGARD (Verviers).
PIERRE FAGARD (Bronte], Forêt, près Verviers).
DR. GROTHE (Berlin).
CH. MÜLLENDORFF (Verviers).

APPENDIX N.

THE undersigned flax yarn spinners, weavers, bleachers, and throwsters, declare herewith that they agree to the adoption of a length of

1,000 meters per hank, and 10 subdivisions at 100 meters each, and that they consider the 2½ meters as length of the reel for coarser and 1¼ meter for the finer numbers the most practical.

(Signed)
C. Oberleithner (Hannsdorf-Wiesenberg).
Josef Heider (Freiwaldau).
Moritz Emmer (Moravian Schönberg).
Robert Siegel (Moravian Schönberg).
S. Manssel (Moravian Schönberg).
Franz Heinze.
Weiss and Grohmann (Vienna).
Ernst Regenhart (Vienna).
F. C. Gottlieb (Leipsic).
Anton Schmidt (Great Ullersdorf).
J. Schindler (Krumau).

APPENDIX O.

Statement of Mr. Julius Karcher relative to his Sorting Scales exhibited to the Congress.

I now come to the, in my opinion, very important question of sorting scales (Romaines), and call your attention, at the beginning, to the fact that they are not micro-metrical, or balances. They consist in the following :—

1. For silk, in a comparative sorting-scale on the basis of 100 grams and 100 meters on the one side, compared with the old determining of the litre on the basis of Deniers and 400 yards, Milan measurement (476 meters).

With regard to the determining of the litre of this article, I am in favour of making numerous experiments with a reduced length, namely, from 10 to 20 experiments of 100 meters, and of taking the average of 10 experiments as the actual number.

2. The second balance is arranged on the basis of 100 meters and 100 grams. In my opinion, and in that of Mr. Saladin, relative to which I reserve to myself the privilege of conferring with you hereafter, it is the sorting-scale of the future for cotton, wool, and all yarns of a certain regularity.

Reflect well, that I have not constructed this *Romaine* as a balance, but for the purpose of being adopted hereafter, in practice for all regularly spun fabrics.

3. The sorting-scale, arranged on the basis of 1,000 meters, and 1,000 grams, should in my opinion, be that prescribed by law. That which it indicates is the metrical number in the kilo for a skein of 1,000 meters.

It is very well arranged, and the system to which it adheres gives a more exact result than that which is obtained by the sorting-scales hitherto employed.

APPENDIX P.

ALPHABETICAL LIST OF ENROLLED MEMBERS OF THE INTERNATIONAL CONGRESS FOR DISCUSSING THE QUESTION OF A UNIFORM NUMBERING OF YARN.

7th to 12th July 1873.

PRESIDENT:

Jos. Chevalier von Reckenschuss, President of the Chamber of Commerce in Vienna.

OFFICIAL DELEGATE OF THE GENERAL DIRECTION:

Imperial Councillor of the Ministry of Commerce, Dr. F. Migerka.

VICE-PRESIDENTS:

Dr. F. Migerka (Vienna).
Henry Lister, Esq. (Bradford, England).

SECRETARIES:

Mons. J. Duckerts (Verviers, Belgium).
Dr. Hermann Grothe (Berlin, Prussia).
Dr. Max Weigert (Berlin, Prussia).

PREPARATORY COMMITTEE:

Josef Chevalier von Reckenschuss (Vienna), Chairman.
Imperial Councillor Dr. Franz Migerka (Vienna), Reporter.
Director, C. L. Falk (Vöslau).
Director Bruno Henneberg (Pottendorf).
Imperial Councillor, Dr. Carl Holdhaus, Secretary of the Chamber of Commerce (Vienna).
John Baptist Kirschnek (Vienna).
Carl Löw (Brünn).
Carl Chevalier von Offermann (Brünn).
Director Gustav Pacher von Theinburg (Vienna).
Adolf Reymann (Freiwaldau-Austr, Silesia).
M. E. Schwarz (Brünn).
Imperial Councillor, Carl Friedrich Seutter von Lötzen (Vienna).
Wilhelm Teuber (Brünn).

MEMBERS OF CONGRESS:

*Bahse, M. F., Delegate of the Chamber of Commerce in Chemnitz.
Bauer, Otto Edler v., Woollen Goods Manufacturer in Brünn.
Bazant, Johann, Dr., Secretary of the Chamber of Commerce and Industry in Brünn.
Bentz, J. G., Carded Yarn Spinner in Linz.
Berber, J., Representative of the Firm L. Auspitz' grandchildren, Woollen Goods Manufacturers in Brünn.
Borkenstein and Son, G., Cotton Mill Proprietors at Neudau and Burgau, Styria.
*Cantoni, E., Manufacturer.
*Centner, Charles, Delegate of the Yarn Spinners of Verviers, Belgium.

The * denotes the active participation in the proceedings of the Congress.

Charwát, Imperial and Royal Chief of Department in the Ministry of Commerce, Vienna.

Ctibor, Carl, Cloth Manufacturer in Tabor, Bohemia.

Czerny, Jos. Eug., Director of a Manufactory in Eisenbrod, Bohemia.

*Dredge, James, Editor of the "Engineering," London.

*Dauphinot, S., Delegate of the Chamber of Commerce in Rheims.

Degerman, E., in Markirch, Alsace-Loraine.

Dittrich, Carl, Flax Spinner and Linen Manufacturer in Zyrardow, Russia.

*Duckerts, J., Representative of Spinners in Verviers.

*Ehret, C., Worsted Yarn Spinner, Delegate of the Chamber of Commerce in Plauen in Saxony.

Emmer, Moriz, Director of the Flax Mill in Zautke, near Schönberg, Moravia.

Engel, Theodor, Director of the Cotton Mill in Tattendorf, near Baden, Lower Austria.

Eras, Dr., Delegate of the Chamber of Commerce in Breslau.

*Fagard, Severin, Spinner in Verviers.

*Fagard, Pièrre, Spinner in Verviers.

Fedra, L., Director of the Spinning and Weaving Factory of His Imperial Highness Archduke Albrecht at Teschen in Silesia.

Fluss, J., Cloth Manufacturer in Freiberg, Moravia.

*Ganahl, Carl, Cotton Yarn Spinner, Feldkirch.

*Gottlieb, F. C., Representative of the Chamber of Commerce, Leipsic.

Grimm, C., Fabrikant, Delegate of the Chamber of Commerce, in Zittau.

*Grothe, H., Dr., Engineer, &c., at Berlin.

Grützner, E., Delegate of the Chamber of Commerce in Zittau.

Gülcher, Oscar, Woollen Goods Manufacturer, Bielitz-Biala.

Haas, Simon (Firm, B. Engel and Co.), Brünn.

Hardt, R., Delegate of the Chamber of Commerce in Lennep.

Hasenöhrl, Richard, Dr., Assistant Clerk in the Ministry of Commerce, Vienna.

*Hanszel, Director of the Flax Mill, Schönberg, Moravia.

*Heide, Joseph, Manager of the Linen Factory of Messrs. Regenhart and Raymann in Freiwaldu.

*Henneberg, B., Director of the Cotton Mill in Rottendorf, near Vienna.

Heinz, Franz, Linen Manufacturer in Freudenthal, Austrian Silesia.

*Hetzer, Adolf, Manufacturer, Vienna.

Hofman, A., Vice-President of the Chamber of Commerce in Bradford, Great Britain.

*Herrmann, F., Representative of the Wool and Cotton Mills of F. Schmitt in Sticha and Semil, Bohemia.

Kafka, Gustav, Spinner (Firm Moriz Kafka and Co.), in Brünn.

*Karcher, J., Floret Spinner in Colmar, Delegate of the Chamber of Commerce in Mühlhausen.

Kaselowski, Delegate of the Chamber of Commerce in Breslau.

*Kirschnek, J. B., Silk Spinner in Vienna.

Klein-Schlatter, C. F., Delegate of the Chamber of Commerce in Barmen.

Kolbe, J. N., Factory Director in Vienna.

*Kossuth, Stephan, Technologist in Warsaw, Russia.

*Kreller, E., Director of the Worsted Yarn Factory in Vöslau.

Kunz, Carl, Manufacturer.

Kurz, Book-keeper of the Cotton Mill in Prossnitz.

Landsberger, A., in Friedek, Austrian Silesia.

Lang, Joseph, Manufacturer in Traun, Oberösterreich.

*Lejeune, Director of the Feesdorf Spinning Factory.
Lister, Henry, in Bradford, Great Britain.
*Lundström, C. L., Factory Proprietor in Gotenburg, Sweden.
Machold, W., Linen and Cotton Goods Manufacturer in Bennisch, Austrian Silesia.
Marbach, Hermann, Proprietor of the Rauschengrund Cotton Mill, Bohemia.
Menzl, E., Factory Director of the Firm A. Schauman & Co., Stockerau.
*Migerka, F., Dr., Imperial Councillor in the Ministry of Commerce at Vienna.
Morel, Director of the Société Linière de la Lys, in Ghent, Belgium.
*Müllendorff, Charles, Delegate of the Chamber of Commerce in Verviers, Belgium.
Müller, H., Linen and Thread Spinner in Hirschfelde, near Zittau.
*Müller, M., Editor of the "Engineering," London.
*Oberleithner, Carl, Representative of the Wiesenberg Flax Spinning Factory, Schönberg, Moravia.
Ölsner, G. H., Weaving Master in Werdau, Kingdom of Saxony.
Offermann, August, Woollen Goods Factory Director in Brünn.
*Pacher, Gustav v., Factory Director, Vienna.
Pastor, Gottfried, Proprietor of the Carded Yarn Spinning Factory at Aix-la-Chapelle.
*Penzig, A. G., Delegate of the Chamber of Commerce, in Chemnitz.
Pokorny, Theodor, Delegate of the Chamber of Commerce in Lennep.
Popper, Julius, Representative of the firm Heinrich Kafka, Woollen Goods Merchants, Brünn.
*Preibisch, C. A., Delegate of the Chamber of Commerce in Zittau.
*Reckenschuss, J. R. v., President of the Lower Austrian Chamber of Commerce and Industry in Vienna.
*Regenhart, Ernst, Linen Goods Merchant, Vienna.
Reibhorn, Johann, representative of the firm Reibhorn & Friedl, Woollen Goods Merchants, Brünn.
Reick, Max, Manager of the Cotton Goods Factory in Prossnitz.
Richter, Fl. A., Director of the Cotton Mill at Brodec in Bohemia.
*Rieter, H., Colonel, Winterthur, Switzerland.
*Rondot, Natalis, Delegate of the Chamber of Commerce in Lyons.
*Roscher, Carl, Dr., Delegate of the Chamber of Commerce in Zittau.
Russo, Alfred, Representative of the firm Russo-Finzi, Cloth Manufacturers at Freiberg in Moravia.
Salcher and Sons, Cotton Thread Spinners in Vienna.
Scheller, Richard, Manufacturer, Delegate of the Chamber of Commerce in Dresden.
Schenk, C. F., Yarn and Wool Agent, Pösnek, Saxe Meiningen.
Schlösser, Heinrich, Spinner, Russland.
Schöller, G. R. v., Woollen Goods Factory Proprietor in Brünn.
Schöller, Rudolph, Zürich.
Schindler, Franz, Director of the Moravian Flax Spinning Mill in Bohemian Krumau.
Schlumberger, A., Manufacturer in Gebweiler, Delegate of the Chambers of Commerce in Colmar and Mühlhausen.
Schmidt, Anton, Linen Goods Manufacturer at Great Ullersdorf, Moravia.
Scheibler, Carl, Lodz, Russia.
*Schwarz, M. E., Yarn Merchant, in Brünn.
*Seutter, Carl v., Cotton and Yarn Merchant, in Vienna.
*Shaw, William Willans, Delegate of the Chamber of Commerce at Rochdale, Great Britain.
Siegl, Robert, Representative of the firm Carl Siegl, sen., in Moravian Schönberg.

Sieber, Carl, Representative of the firm Sieber & Jerabeck, Vienna.
Steinbrecher, L., Flax Spinner in Bohemian Krumau.
Strakosch, Isidor, Representative of the firm Strakosch Brothers, Woollen Goods Merchant in Brünn.
Strakosch, Simon, Representative of the firm Salomon Strakosch, Sons, Woollen Goods Merchants in Brünn.
Stuki, Wilhelm, Manufacturer in Vöklabruk, Upper Austria.
*Teuber, Wilhelm, Spinner (firm J. Teuber & Sons), Brünn.
Thornton, Th., Spinner, Vienna.
Wagner, J. B., Linen Goods Manufacturer in Moravian-Schönberg.
Wauer, A., Herrnhut, Delegate of the Chamber of Commerce in Zittau.
Weinberger, Adolph, Representative of the firm Strakosch and Weinberger, Woollen Goods Merchants in Brünn.
*Weigert, Max, Dr., Factory Proprietor in Berlin.
*Weinmann, Dr., Reporter of the Royal British Commission for the Vienna Exhibition, London.
Weiss, Adolph, Linen Thread Spinner in Vienna.
Weiss, Franz, Director of Flax Spinning Factory in Friedland, Moravia.
Wojtech, Franz, Silk Manufacturer in Vienna.
*Welsch, Carl, Manager of the Spinning Factory in Augsburg. J. F. Chur & Sons, Representatives of the Augsburg Collective Exhibition of Cotton Yarns and Textures.
Wolf, Sigmund, jun., Cotton Goods Manufacturer in Prossnitz.
Wolf, A., sen., Cotton Goods Manufacturer in Prossnitz.
*Wolff, Counsellor of Commerce in Mönch-Gladbach, Delegate of the Chamber of Commerce, in Breslau.
Zollikofer, Adolph, Zurich.

APPENDIX Q.

MEMBERS of the PERMANENT EXECUTIVE COMMITTEE, elected at the fifth meeting of the INTERNATIONAL UNIFORM YARN NUMBERING CONGRESS, held in the Session-Hall of the Lower Austrian Industrial Association, at Vienna, 11th July 1873.

Alcan, Professor at the Conservatoire des Arts et Métiers in Paris. France.
Bahse, Alfred, President of the Chamber of Commerce at Chemnitz, Saxony. Germany.
Cantoni, Baron Eugen, Austro-Hungarian Consul at Milan. Italy.
Dauphinot, President of the Chamber of Commerce at Rheims. France.
Dittrich, C., Proprietor of the Flax Spinning and Weaving Mill at Girardow, near Warsaw. Russia.
Dmitrieff, Professor at the Polytechnic in Moscow. Russia.
Ehret, Carl, Worsted Yarn Spinner at Reichenbach, near Plauen, Saxony. Germany.
Emmer, Moritz, Director of the Flax Spinning Mill at Zautke, near Schönberg, Moravia. Austria.
Gottlieb, F. C., Merchant at Leipsic. Germany.
Gröw, President of the Chamber of Commerce at Copenhagen. Denmark.
Grothe, Dr. Hermann, Engineer and Docent at Berlin. Prussia.

Grützner, E., Member of the Chamber of Commerce at Zittau, Saxony. Germany.
Hassler, Director of the Spinning Mill at Augsburg. Bavaria.
Hetzer, Adolf, Factory Proprietor in Vienna. Austria.
Hemptinnes, J., Factory Proprietor in Belgium.
Henneberg, Bruno, Director of the Cotton and Weaving Mill in Pottendorf, near Vienna. Austria.
Hoffmann, A., President of the Chamber of Commerce at Bradford. England.
Holdhaus, Carl, Dr., Imperial Councillor, Secretary of the Chamber of Commerce at Vienna. Austria.
Karcher, Julius, Factory Proprietor at Colmar, Alsace Loraine. Germany.
Karmarsch, Carl, Dr., Director of the Polytecnnic Institution at Hanover. Germany.
Kaselowski, Royal Councillor at Bielefeld. Germany.
Kirschneck, J. B., Proprietor of the Floss-silk Factory at Vienna. Austria.
Kossuth, St., Engineer, Warsaw. Russia.
Kreller, E., Director of the Worsted Yarn Factory at Schedewitz, near Zwickau, Saxony. Germany.
Lister, Henry, Factory Proprietor at Bradford. England.
Lohren, A., Director of the Spinning Mill at Potsdam Neuendorf, Prussia. Germany.
Lundström, Carl L., Factory Proprietor at Gothenburg. Sweden,
Migerka, Franz, Dr., Imperial Ministerial Councillor, Vienna. Austria.
Morel, Henri, Linen Manufacturer, Secretary of the Society "De la Lys," in Ghent. Belgium.
Morin, General, at Paris. France.
Müllendorf, Charles, Vice-President of the Chamber of Commerce at Verviers. Belgium.
Mundella, Anthony J., Member of Parliament for Sheffield, in London. England.
Neydonnoff, Manager of the Exchange at Moscow. Russia.
Pacher von Theinburg, Gustavus, Cotton Factory Director at Vienna. Austria.
Pasquay, Fritz, Proprietor of the Carded Yarn and Silk Factory at Wasselnheim, Alsace Lorraine. Germany.
Peltzer, Edward, Factory Proprietor at Verviers. Belgium.
Penzig, August, Merchant at Meerane, Saxony. Germany.
Raymann, Adolph, Linen Manufacturer at Freiwaldan, Silesia. Austria.
Reckenschuss, Joseph Chevalier von, President of the Chamber of Commerce at Vienna. Austria.
Rieter, H., Colonel, at Winterthur. Switzerland.
Rondot, Natalis, Member of the Chamber of Commerce at Lyons. France.
Roscher, Carl, Dr., Secretary of the Chamber of Commerce at Dresden, Saxony. Germany.
Scheller, Richard, Member of the Chamber of Commerce at Dresden. Germany.
Schlumberger, Adolph, Factory Proprietor at Gebweiler, Alsace Lorraine. Germany.
Schwarz, M. E., Carded Yarn Merchant at Brünn. Austria.
Seutter von Lötzen, Carl, f., Cotton and Yarn Dealer at Vienna. Austria.
Steinbeis, Baron von, President of the Central Department for Trade and Industry at Stuttgart, Wirtemberg. Germany.
Teuber, W., Proprietor of the Carded Yarn Factory at Brünn. Austria.
Wauer, Adolph, President of the Chamber of Commerce at Zittau, Saxony. Germany.

Weigert, Max, Dr., Factory Proprietor at Berlin. Germany.

Weinmann, Dr. Fr. L., Reporter of the Royal British Commission for the Vienna Universal Exhibition, London. England.

Weiss, Adolph, Manager of the firm Weiss and Grohmann at Vienna. Austria.

Wolf, Oscar, Director of the Carded Yarn Spinning Company in Voslau, near Vienna. Austria.

Wolfrum, Carl, senior, Factory Proprietor in Aussig on the Elbe, Bohemia. Austria.

Zemann, Johann, Docent at the Polytechnic Institution at Prague, Bohemia. Austria.

APPENDIX R.

MEMBERS of the MANAGING EXECUTIVE COMMITTEE at VIENNA.

Henneberg, Bruno.
Hetzer, Adolph.
Holdhaus, Carl, Dr., Secretary.
Kirschnek, J. B.
Migerka, Franz, Dr.
Pacher von Theinburg, Gustav, Vice-President.
Reckenschuss, Joseph, Chevalier von, President.
Seutter von Lötzen, Carl f.
Teuber, Wilhelm.
Weiss, Adolph, Secretary.
Wolf, Oscar.

APPENDIX S.

[TRANSLATION.]

CIRCULAR LETTER addressed to all Foreign Members of the Permanent Executive Committee of the INTERNATIONAL UNIFORM YARN NUMBERING CONGRESS.

THE undersigned Committee formally constituted itself on the 27th November of the current year in order to take in hand, after the close of the Vienna Universal Exhibition, the task deputed to it by the International Congress, for the introduction of a uniform numbering of yarn, with all the zeal which the important subject demands.

We proceed to this work inspired by the hope of a successful result. Extraordinarily great as the advantages must prove to be to the manufacturers and consumers of yarns, who may be reckoned by millions, as well as to the merchants and manufacturers of the entire spinning and weaving trades, of a uniform numbering of yarn in all countries of the world, proportionately small do the difficulties appear to be which oppose the unanimity achieved at the meetings of the Congress, and, with small sacrifices would those connected with the branches of industry alluded to be able to obtain the credit of having been the first who were successful in attaining complete uniformity in weight and measure in an important department of International trade.

The principles approved by the International Congress are distinguished just as much by their simpleness and easy comprehension, as by their strictly systematical arrangement, and worthily join hands with that system of weights and measures, which on account of its scientific basis will at no distant date be probably the one generally prevailing, viz., with the metrical system.

The next task of the members of the Committee elected by the Congress would be to endeavour to obtain the merited recognition of the new system of numbering yarn amongst the merchants and traders of their district; to advocate the great advantages of this system both verbally at meetings and in private intercourse, and to refute the objections which may perhaps be raised against it in a pertinent manner; but more especially we beg to recommend to you the formation of a local Committee in your town, which, in conjunction with you, will kindly represent and energetically promote our mutual undertaking.

In order to offer a central organ of discussion and report for all these simultaneously active members and committees residing in various countries and industrial districts, the undersigned Committee has furthermore resolved to bring to the knowledge of all interested parties information concerning the arrangements made and the steps taken in the several countries and districts for the introduction of the new system of numbering yarn, and of the results obtained by means of its own official Correspondence Journal, appearing periodically according to requirements. Space will be allotted in this paper (the widest circulation of which will be the object of our especial care), for the technical discussion of all questions arising out of this subject.

We now request you to kindly state:

a. Whether you are disposed to form at once a local committee in your district, and how far this district would extend?

b. Whether you have special proposals to make relative to the arrangement and circulation of the above-mentioned Correspondence Journal, and if so, what they are?

c. What, in your opinion, could or should be done generally in order to attain very soon favourable or practical results in the matter occupying our attention.

Looking forward to your kind reply with lively interest, we avail ourselves of the welcome opportunity to place our collective services at your disposal.

Vienna, 10th December 1873,

(Signatures):
GUSTAV PACHER VON THEINBURG,
Vice-President.
CHEVALIER J. VON RECKENSCHUSS,
President.
DR. CARL HOLDHAUS,
Secretary.

Letters and papers are to be addressed to the Chamber of Commerce and Manufacturers at Vienna (Austria).

APPENDIX T.

[TRANSLATION.]

EXTRACT from the *L'Union libérale* of Verviers, 4th December 1873, reporting the adoption of the RESOLUTIONS passed by the INTERNATIONAL CONGRESS of VIENNA, respecting the UNIFORM NUMBERING of YARN.

UNIFORM NUMBERING OF YARN.

The meeting of spinners, which was announced several days ago, took place yesterday evening at the rooms of the "Société Industrielle," and the results exceeded by far the expectations of its promoters.

The meeting consisted of about 40 persons, representing more than 30 firms, and among this number were the most important in the yarn trade, including some of the largest manufacturers.

Thus composed, it contained at least two-thirds of the spinning interest of our district, which circumstance gives a considerable weight to its resolutions.

The meeting was presided over by M. Charles Müllendorff, Vice-President of the Chamber of Commerce, Delegate to the Vienna Congress, and member of the permanent Executive Committee of the said Congress, supported by M. Edward Peltzer, member of the same permanent Committee, and M. Julius Duckerts, Secretary of the Chamber of Commerce and Delegate to the Vienna Congress.

M. Müllendorff, after a succinct resumé of the mission accomplished by the delegates of Verviers at Vienna, and of the result of the deliberations of the Congress, opened the discussion upon the order of the day,—

> ~~"Skeins of 1,000 meters.~~
> "Circumference of reel 1·50 meter.
> "Packing in parcels of 5 kilograms."

The most interesting part, however, of the debates was the endeavour to find means to put the recommendations of the Congress into practice.

A spinner, forestalling the wishes of the Committee, proposed to agree at once to a compromise to the following effect, namely:—

> "To enter into a formal engagement according to which the producers, merchants, &c. of the district shall undertake, from a certain date, to supply for general use no other yarn than such as is made up according to the new system."

The originator of the proposal clearly proved that the yarn of Verviers is indispensable to the buyers, not only by reason of its qualities, but also on account of the easy facilities of credit which they can scarcely obtain anywhere else.

The proposition having been strongly supported on several sides, was put to the vote and adopted almost unanimously.

The 1st November 1874 was fixed as the date of the resolution being put into practice.

In order to give it due effect the terms of the engagement will be signed and published with the names of the adherents, so that all misunderstanding may be avoided and any infraction rendered difficult, if not impossible.

Only three firms gave a contrary vote, or rather deferred their adherence, but declared themselves ready to join the majority as soon as the competitors in the Rhenish provinces shall have done the same.

There is, however, not the least doubt that the spinners in the Rhenish provinces will gladly welcome the introduction of the reform, and the unanimity of the producers will, consequently, easily overcome any opposition which may be made on the part of the buyers.

We may therefore consider the uniformity of the systems of numbering as a *fait accompli*, and the Congress, which next year will meet at Brussels, will be able to chronicle the fact that at least in our district the labours of our delegates have not been without a good and practical result.

DR. F. L. WEINMANN.

MEMORANDUM AS TO THE FLAX CONGRESS.

MEMORANDUM on the PROCEEDINGS of the INTERNATIONAL CONGRESS of CULTIVATORS and SPINNERS of FLAX and MANUFACTURERS of LINEN, by Dr. FR. L. WEINMANN.

THE third of the series of International Congresses held in connexion with the Universal Exhibition at Vienna, to which the Royal Commission directed its special attention was that of flax growers and spinners, and manufacturers of linen, which took place on the 19th, 20th, and 21st August 1873.

The chief object of this Congress was to take into consideration the plans and means best adapted to increase and improve the cultivation of flax, to make it more remunerative to the agriculturalist, and to supply the spinner and manufacturer with a better and cheaper working material.

Flax is an important item in industry and commerce.

As an article of agricultural produce it is very valuable to the farmer, and a rational mode of cultivation and preparation of the plant and fibre as an industrial and commercial commodity has long been considered all important by all civilised nations.

The competition of cotton and the staple articles manufactured therewith is, indeed, very great, but not of such a kind as to supersede flax and linen altogether; and in England, Belgium, France, Germany, and Austria-Hungary, Governments and Associations as well as individuals endeavoured for years to improve the culture of flax. Even in Russia, whose production of linseed and flax far exceeds its home consumption, the Government has taken a great interest in this article, and by various means promoted and facilitated the trade in these products.

The Vienna Exhibition afforded a favourable opportunity of comparing the state of flax culture in the different countries; of examining the products of flax arrayed in the various agricultural departments and special pavilions in which also many valuable and instructive graphical tables and representations of the production and consumption of flax were exhibited, and of assembling from all flax-growing countries men of science, agriculturists, manufacturers, and men of practical experience in an International Congress to discuss matters of great importance to them all.

The progress of the flax industry is worthy of attention.

Belgium, Great Britain, Ireland, and France showed for some time a great advance as compared with other flax-growing countries, in consequence of the introduction of mechanical flax spinning, but the Vienna Exhibition has proved that Austria and Germany have not remained behind, and that they have taken the lead in several branches of this at one time purely domestic but now almost exclusively factory industry.

In the French department various sorts of flax from Algeria were to be seen, which excited a lively interest. The cultivation of flax is there commenced in February, and the harvest takes place in May. However, there is also another time for sowing in Algeria, namely, the month of October or beginning of November. The flax of this autumn sowing is gathered at the end of April of the following year. The specimens exhibited were not samples of a merely tentative cultivation, but were worthy proofs of the excellent qualities of the Algerian flax already brought into commerce in large quantities.

Belgium, the cradle of the higher cultivation of flax, also took part in the Exhibition, albeit with only a few specimens. But honour to whom honour is due! The Courtrai-flax still takes the first rank as regards quality, it is very much liked on account of its bright colour, so desirable for bleaching-yarns, and is only likely to meet with competition in the lower assortments, if the prices quoted by a Belgian exhibitor, which were manifestly too high, should serve as a standard. In this wonderland of flax cultivation the natural preliminary conditions of flax culture prevail to a considerable extent, human industry contributes its best aid, and thus the culture of flax there is seen to take precedence of the cultivation of beetroot. Cheap means of transport, more especially canals, enable the flax-straw to be conveyed great distances to the most suitable steeping-ponds, and a wise Government provides for the promotion of the growth, as well as in like measure for the most advantageous disposal of the valuable spinning-fibres, and among other Belgian exhibitors from Bruges, Courtrai, Lovendeghem, Moorbeeke, and Ruddervoorde, the exhibit of the Belgian Ministry of the Interior was noticed as an excellent representation of Belgian flax.

In Holland almost the same conditions prevail in cultivation as in Belgium. Numerous societies have interested themselves in the promotion of the growth of flax and flax seed. Proofs of the results which these corporations were in a position to attain were abundantly displayed in the

Exhibition. The Society for the promotion of the flax trade, as well as the association for the cultivation of the Marsh at Herzogenbusch, Gransberg & Co., of Rotterdam, Hoogterp, and Posthuma and Gorter, of Dockum, exhibited samples of excellent Dutch flax.

There were also some exhibitors from the northern countries where linen weaving is still carried on as a domestic trade, as is the case in Sweden, Norway, and Denmark. Orlow Andersen, of Friedriksborg, may be considered the best cultivator of flax among them.

The products of flax culture were much more abundantly represented in the Eastern Agricultural Hall than in the Western. The exhibits of Germany, Austria, and Russia gave an almost complete idea of the present state of the cultivation of flax in these countries, and one which, as regards this article, was displayed at none of the preceding International Exhibitions to such a perfection.

In the department of the German empire, excellent flax was exhibited from the Rhine districts and Westphalia, where the green steepings (grünröste) are frequently used. The Agricultural Society of Rhenish Prussia reported an extraordinary yield. The scutched flax amounted, according to this statement, to from 990 to 1,125 kilograms per hectare. With regard to the mode of cultivation it was stated that this remarkable result was to be attributed to the following process: previous crop, oats; before that, clover; manure in the autumn; straw taken off in the spring, and then manured with muck-water and guano to the extent of about 100 kilos per hectare.

Numerous collective exhibitions afforded valuable instruction respecting the endeavours made in Germany for promoting the cultivation of flax. Amongst these must be mentioned the exhibits of the General Committee of the Agricultural Society at Munich, and the collective exhibition from the Government district of Wiesbaden. The culture of flax is making favourable progress in the district of the upper Westerwald, owing to the great amount of grass the soil produces, where the crops are mostly reared on pasture land. Flax was also exhibited from the south-western declivity of the Westerwald, from the low plains of the Lahn, and from the neighbourhood of Ilsen. The verdict upon them was favourable, although dew-retting is still prevailing there. In the Hanoverian Collective Exhibition the flax from the district of Osnabrück, and more particularly from Hunteniederung, represented the produce of the eastern portion.

In consequence of the introduction of flax-spinning by machinery, the cultivation of flax has also made progress in Saxony, Samples of such were shown in the Collective Exhibition of Saxon Agriculturists. The Agricultural Central Depôt of Stuttgart supplied textile plants in seed and stalks, as well as scutched and combed bast (fibres), and its exhibit was one of great superiority. The arrangement of it merited unqualified praise, and the contents showed that even in countries less adapted for the culture of flax very successful results can be obtained by diligent cultivation.

The Royal Prussian Government was from time immemorial at the head of the endeavours to promote the growth of flax in Germany. It certainly never failed to make considerable sacrifices in this respect, as may also be said of the Government of Würtemberg. And where as in Westphalia, and especially in Prussian Silesia, the progress of flax culture can be recorded, it must be acknowledged that it is the result of the well-known measures of the Government and of separate important societies. Many large landowners in Prussian Silesia cultivate flax as a favourite occupation. The great productive powers of numerous estates in the districts of Constadt, Kreuzburg, Namslau, and Rosenberg was amply illustrated by the samples exhibited. The flax grown on these estates is highly esteemed by the spinners, and mostly passes at the flax market of Breslau from the hands of the grower direct into those of the spinners.

In Germany about five per cent. of the arable land is annually farmed with flax and hemp. About 15 millions of marks value is annually imported, and about 10½ millions of marks value exported, so that there also the requirements do not by any means appear to be covered.

The increased demand for textile material, and the endeavour to raise the value of the produce of the soil, have also, in Austria, directed the attention of the authorities to the promotion of the cultivation of flax. To the initiative of two agricultural societies of Moravia, and the co-operation and support of the Imperial Government, thanks will be due if the permanent maintenance of so valuable a branch of culture and its serviceable application to industry should prove successful. In Lower Austria and Carinthia, in Bohemia, the Tyrol, and in Gallicia, in fact, everywhere, eminent men and corporations have headed the movement set on foot. All exertions to represent the article "flax" at the Universal Exhibition in so excellent a manner, as only the standard countries of flax-culture were at other times able to do, were crowned with success.

Who could undervalue such meritorious efforts as those of the agricultural societies of Mährisch-Neustadt, Mährisch-Schönberg, of the agricultural societies of Vienna, Laibach and Innspruck, of Princess Francisca Liechtenstein of Liechtenstein, in Seebenstein, Lower Austria, of Count Althann, of the spinning factories at Teschen, Hannsdorf, Heidenpiltsch, Friedland, and many more? The specimens of flax exhibited were mostly samples of what can be produced from the Austrian flax-straw by means of the Belgian mode of retting and dressing.

Such successful results in so many respects encourage the hope that the flax growers will follow these brilliant examples, and in point of fact it is very gratifying to observe that, especially in the south-west of Moravia, the large and small landowners are already bringing considerable quantities of scutched water-retted flax into the market.

In mountainous districts where the flax harvest is later, the water hard and of low temperature, and where limited capital forces the small landowner to turn the harvest he has reaped to account in the same year, cold water retting will probably be difficult of introduction. But even here the better working-up of the dew-retted flax by hand, or by machinery where labour is dear, will probably come into use. There is no doubt that the Universal Exhibition not only showed in the most brilliant manner the advances made by the most eminent Austrian cultivators of flax in these respects, but also that this contest will likewise have a stimulating influence on those less advanced and unrepresented.

The mountainous districts of Austria are excellently adapted for the cultivation of flax. It only requires general co-operation in order to cover the deficit now apparent as between the consumption and the production. The maps and tables compiled by Baron Arthur von Hohenbruck, and exhibited in the pavilion of the Imperial and Royal Ministry of Agriculture were a very valuable production, and the explanatory text contained many noteworthy hints concerning the present state of the cultivation of flax in Austria, and the steps taken in so many directions for the promotion of its culture.

The manufacture of weft-yarn is a speciality of Austria. Extending as far as Zautke in Moravia, it has its chief seat in Bohemia, and particularly in the districts of Trautenau and Hohenelbe. The importance of the Bohemian weft-yarn manufacture is proved by the fact that the prices of the Trautenau market rule those of Austria, Prussian Silesia, and Saxony. The collective exhibition of the Trautenau and Hohenelbe spinners was excellent, and the spinning mill of Schönberg in Moravia excelled in warp yarn.

Besides the countries mentioned above, Russia for the first time, made an interesting show of flax products. Russia's mechanical flax spinning dates from the same time as that of Austria. Girardowo, in Russian Poland, and Weigelsdorf, in Lower Austria were both erected under the superintendence of de Girardé, and number, consequently, among the eldest flax-yarn machine spinning mills. But it appears that Russia has been slower than the German Customs Union and Austria in adopting the machine spinning system improved and completed by the English. Austria has already in 1850 and following years introduced original English and French imitations of English machines, and recently also original flax-spinning machines of Fairbairn's and Lowson's. The number of spindles amounts to 398,571 against 260,000 in Germany, and 1,640,000 in England. The number of spindles in Russia could not be ascertained, but it is steadily increasing. Information, however, was obtained by means of the Exhibition of the Exchange Committee of Riga regarding the markings of the quality. The Statistical Committee at Pskow had exhibited a map of the flax-growing provinces of Russia, and contributed as rich an assortment of specimens of that article from that extensive territory of production as are current in commerce.

According to the trade report published by the Ministry of Finances, Russia exported in the year 1871 :—

		Roubles.
2,400,000 tchetwerts of flax-seed,	value	28,700,000.
9,000,000 poods of flax -	„	50,000,000.
930,000 „ of flax-tow -	„	2,325,000.

If to this is added the export of—

Flax (linen) yarn - -	„	2,000,000.
Sailcloth - - -	„	225,000.
Ravencloth - - -	„	25,700.
Sackcloths - - -	„	750,000.

The total value of export amounts to 84,025,700 roubles, compared with which the import of fine linen amounting in value to about three million roubles, is insignificantly small.

It is due to Baron von Schwarz-Senborn, the Director-General of the Exhibition, to have taken the initiative of convening the International Congress to deliberate on the all-important question of extending and improving the cultivation of flax.

In October 1871, His Excellency entrusted to the chairman of the Agricultural Society of Moravian Schönberg, Mr. Carl Oberleithner, the task of making the necessary arrangements for the meeting of the Congress.

Besides the support which was accorded to Mr. Oberleithner by the various societies, &c. in Austria, the idea of the Congress was highly approved of in Germany, and Mr. F. Kaselowsky, Royal Prussian Commissioner and President of the German-Austrian Linen Industry Association at Bielefeld, invited Mr. Oberleithner to a conference at Berlin, at which, in April 1872, with the assistance of Mr. C. Flandorffer, of Hannsdorf, in Moravia, the principles of the questions to be discussed by the Congress were settled.

In July 1872, it was arranged that a special committee consisting of experts, should take all preliminary arrangements in hand.

As members of this committee were nominated :—

Mr. F. W. Hofmann, Economic Councillor, for the Imperial and Royal Agricultural Society in Vienna.

Mr. Cosmas Schütz, for the Imperial and Royal Agricultural Society of Klagenfurt.

Mr. Richard Dolenc, for the Imperial and Royal Agricultural Society of Laibach.

Count Augustus Fries, for the Imperial and Royal Society for promoting agricultural interests at Brünn.

Mr. J. Böhm, for the Agricultural Society of Moravian Neustadtl.

Mr. C. Oberleithner, for the Agricultural Society of Moravian Schönberg.

Mr. Ignaz Ettrich, spinning factory proprietor at Trautenau.

Mr. Edward Oberleithner, spinning factory proprietor at Moravian Schönberg.

Mr. Leopold Fedra, as representative of the Domain Board in Teschen.

Mr. C. Flandorffer, director of the flax spinning mill at Hannsdorf.

Dr. Mauthner, of Markhof, flax spinning mill proprietor at Troppau.

Mr. Moriz Emmer, director of the flax spinning mill at Zautke.

Mr. W. von Hudec, landed proprietor at Brodky.

Mr. Clemens Walzel, spinning factory proprietor at Trautenau, and

Mr. W. Jerie, spinning factory proprietor at Hohenelbe.

To these were added by coöptation :—

Mr. Josef Peter, Imperial and Royal district captain in Vienna.

Arthur, Baron of Hohenbruck, Imperial and Royal ministerial secretary in the Ministry of Agriculture in Vienna.

Mr. August Leydhecker, professor in Tetschen-Liebwerd.

Mr. Adolf Trientl, travelling teacher in Hall (Tyrol).

Mr. C. Dittrich, flax spinning mill proprietor at Schönlinde (Bohemia).

Mr. J. Kluge, flax spinning mill proprietor at Altstadt near Trautenau (Bohemia).

Mr. Franz X. Grutsch, chairman of the Agricultural District Society at Mödling (Lower Austria).

Dr. H. Hampe, attorney of the Prince Liechtenstein family at Vienna.

Ministerial Secretary Von Pretis, and Aulic Councillor Dr. Migerka were appointed delegates of the General Board of Management of the Exhibition.

In the committee meeting of the 20th July 1872 a general programme (No. 62 of the official publications) was agreed upon, copies of which in the English language were prepared by the Royal British Commission, and forwarded to the chambers of commerce of Great Britain and Ireland for distribution and publication through the press. (*See* Appendix A.)

In accordance with sect. 7 of this programme, a sub-committee of experts and gentlemen of experience was charged with drawing up an *exposé* explanatory of the general questions to be discussed by the Congress. This *exposé* was issued in July 1873 (No. 100 of the official publications), and likewise distributed, and published in the newspapers. (*See* Appendix B.)

The official proclamation of the medals and distinctions awarded to the exhibitors by the International Jury having been fixed for the 18th August, the meeting of the Flax Congress had to be postponed to the following day.

Accordingly, on the 19th August the members of the Congress met for the first time in the session hall of the Jury Pavilion in the Exhibition.

There was a pretty large assemblage of flax growers, spinners, agriculturists, manufacturers, &c., from Belgium, Holland, Russia, Hungary, Austria, Germany, Italy, America &c. (a list of which is given in the Appendix), who all evinced the liveliest interest in the objects of the Congress. Great Britain and Ireland were represented by Mr. Michael Andrews, secretary of the Flax Supply Association in Belfast, and Mr. Henry Dunbar McMaster, of the firm Dunbar McMaster & Co., Belfast, and Dr. Weinmann, member of the staff of the Royal British Commission, attended by special instructions of Mr. Philip Cunliffe Owen, for the purpose of assisting the English members and the Committee as translator, and of drawing up for the Royal Commission a report of the proceedings of the Congress.

Ministerial Councillor Dr. Migerka, as delegate of the Director General Baron von Schwarz-Senborn, opened the proceedings with an address in which he set forth the importance of the Congress; comparing the exclusiveness of former times with the tendency of the present day to solve and settle all social, scientific, economic, and commercial questions of any importance by means of international discussion and agreement. And although admitting that the questions to be discussed by the Congress were not of such a nature as to lead to any immediate practical result, the exchange of opinions in reference to them, and the resolutions to be passed, would be a great step in advance, and of considerable influence in regard to the general improvement of an unquestionably extensive branch of agriculture and industry.

Mr. Carl Oberleithner, as chairman of the preparatory Committee, next addressed the meeting, and submitted a number of communications and essays received, bearing upon the questions before the Congress. Among the latter must be mentioned the treatise "on the Preservation of the "Seed of the Flax Plant in Ireland," by George Orme Malley, Esq., barrister-at-law, communicated by the Royal British Commission; "Cultivation and Preparation of Flax," answers to the questions proposed by the President of the Vienna Universal Exhibition for discussion at the International Flax Congress in August 1873, Vienna, by Robert Sison, Royal Saxon domain administrator at Pirna in Saxony; also treatises by the Agricultural and Forest Culture Society at Moravian Schönberg, by Baron Wolf at Druween in Russia, by E.C. Moll, flax and yarn merchant at Rotterdam; by J. A. Keurenaer, at Delft, in Holland; statistical record and tables respecting the production of flax and hemp in Austria, prepared by the ministerial secretary Arthur Baron von Hohenbruck, and communicated by the Imperial and

Royal Ministry of Agriculture at Vienna; treatises by the Netherlands Society for the promotion of flax industry at Rotterdam in Holland, by Hans Schiller, steward of Prince Liechtenstein's estates at Heinzendorf in Moravia; by Dr. Gaetano Cantoni at Milan in Italy; by Director Ernst Wagner at Kolomea in Galicia; by Miecislaw, Chevalier von Darowski, at Lemberg in Galicia; and "Sixth Annual "Report of the Flax Supply Association for the Improve-"ment of the Culture of Flax in Ireland for the year end-"ing 31st December 1872," and "Instructions of the Flax "Supply Association in Belfast for the Culture and Prepara-"tion of Flax," communicated by its secretary, Mr. Michael Andrews.

On the basis of these essays and treatises, and the views advocated therein, the preparatory committee drafted a number of resolutions proposed to be considered by the Congress. (*See* Appendix C.)

Preliminary to the commencement of the proceedings the Chairman of the Committee submitted the draft of rules regulating the mode of proceedings, which was adopted *en bloc* unanimously (Appendix D.), and proposed the nomination of three secretaries, and on account of the different languages likely to be made use of in the debates, the appointment of three verifiers of the minutes, in accordance with which proposition Dr. Hermann Grothe of Berlin, Baron Arthur von Hohenbruck, of Vienna, and Mr. Ignaz Ettrich, of Trautenau, were appointed secretaries, and Chevalier Wenzel von Hudec, of Brodky (Galicia), Mr. C. Flandorffer, of Hannsdorf (Moravia), and Dr. Fr. L. Weinmann, of London (England), verifiers of the minutes. Baron von Wolff, of Druween, near Riga (Russia), and Mr. Robert Hirt, of Freiberg (Saxony), were elected vice-presidents, and Mr. Carl Oberleithner, chairman of the preparatory Committee, president.

The first question submitted to the Congress, in accordance with the programme (Appendix C.) was in the following terms:—

"WHAT KNOWLEDGE AND EXPERIENCE HAVE ALREADY BEEN GAINED IN REGARD TO THE SELECTION OF LINSEED AND ITS PRODUCTION FOR SOWING SEED? AND BY WHAT MEANS CAN THE SAME BE IMPROVED?"

Captain J. Peter (Vienna), as reporter of the Committee, introduced this question, and moved in addition the following resolutions:—

"1. Taking into consideration the conditions of the linen industry, it appears that above all other kinds the cultivation of the blue blossom common flax (*Linum usitatissimum vulgare*) is the best sort for producing sowing seed.

“In order effectually to obviate the malpractices prevailing in the intermediate trade with sowing seed, it is advisable to establish on a large scale import and seed supply associations.

“ 2. Linseed fit for sowing might and should be much more generally cultivated than is the case at present.

“ 3. For obtaining good sowing seed as well as good fibre the Dutch, and especially the Kortryk, or another similar method of harvesting (Kapellung), is recommended as the most advantageous.

“ 4. For the improvement of flax and linseed culture it is necessary:—

a. To disseminate practical knowledge and modes of manipulation among the flax-growing farmers.
b. To promote the establishment of sowing seed markets;
c. To promote the sale of superabundant and locally degenerated flax seed.

“ 5. Considering that the results of experience hitherto recorded are not sufficient for settling the question as to the production of flax seed, the Congress, having regard to the extraordinary importance of the subject, recommends a continued and thorough study thereof in the various flax-growing countries, and recommends as one of the most important functions of the permanent Committee to be elected that it devotes its full attention to this question.”

In arguing these various points Captain Peter remarked, with reference to resolution 1, that the linen industry in all its branches, and the produce in quantity as well as in quality, of a flax field, is dependent on a prudent selection of sowing seed, and as such, as regards species as well as variety, the common blue flowering plant was everywhere, and particularly in the chief flax-producing countries, Russia, Belgium, Holland, Ireland, acknowledged to be the very best and most useful; on the other hand, a very essential condition of success in the cultivation of flax was, besides the mode of cultivation and the nature of the soil, the origin of the sowing seed, that is, the market or place whence it is obtained, and in this respect that grown in the Baltic provinces of Russia, the Riga, Pernau, Windau, Pskow, and other Russian flax seeds; also the Dutch or

Zeeland species, enjoyed a universal reputation. In the second place, and particularly in Austria and Germany, Tyrolese seed and that grown on the Baltic slopes in the north-eastern districts of the kingdom of Prussia, was mostly used. Much less recommendable, though very useful, was the so-called Draboff flax seed, grown in Central Russia, on the shores of the Dnieper, and exported southward across the Black Sea. Experience had also shown that in the selection of seed varying the same periodically is very advantageous; and in this respect Holland might be taken as an example, her flax farmers procured Russian seed, puikpuik, sowed it not more than twice, and sold to foreign countries the third yield (revelaars grandchild), partly also the second yield (revelaars child) as "Zeeländer," at very profitable prices. This periodical variation was also practised in Russia, the Tyrol, &c.

The greatest evil of the intermediate trade with flax seed was adulteration, which all legal measures of the different governments have not been effective to prevent; and the only remedy to a certain extent seemed to be by publishing the names of fraudulent dealers. Another great injury arose by purchasing sowing seed from small country merchants and traders, and the disadvantages resulting from such custom could only be effectively counteracted, and a supply of a genuine article secured, by the establishment, as proposed, of import companies on a large scale, to act as agents between the consumers and retail dealers on the one hand and the producing country on the other. Co-operative societies for the supply of sowing seed, &c., might also be formed with great advantage.

In reference to resolutions 2 to 4, Captain Peter deplored the general neglect of the cultivation of sowing seed, and instanced once more the example of Holland of producing from the same field excellent flax and sowing seed in superb quality at the same time. Captain Peter also advocated a proper system of cleaning, since the main defect of seed received from Russia is the quantity of weed seeds that is left in the flax seed; such system of cleaning would amply repay the trouble by the enhanced value the seed would acquire thereby.

Mr. Andrews, of Belfast, remarked that the rearing of flax seed depended upon the season, and therefore varied as to quality accordingly. When the season permitted it, the seed naturally dried possessed the highest germinating power; but when the season was adverse, artificial means would be absolutely necessary to render the seed to be trusted ported to its destination with safety so as to retain the germinating properties as perfectly as possible. The various brands of sowing seed should be tested and the per-centage of germinating properties ascertained. This was his practice with all seeds received in Belfast each year, and he was thus enabled to recommend the seed which indicated under ordinary circumstances the best prospect of producing a favourable crop.

The resolutions to Question I. proposed by the reporter, Captain Peter, on behalf of the preparatory Committee, having been adopted unanimously with some small alterations, the Congress entered upon the discussion of Question II. :—

"WHAT SYSTEMS OF FLAX CULTIVATION ARE IN OPERATION ?

"WHICH ARE THE BEST ? and

"WHAT MEANS WOULD BE THE MOST PRACTICAL FOR PROPAGATING AND EXTENDING THE APPLICATION OF THESE SYSTEMS ?"

Professor Leydheker (Tetschen-Liebwerd, in Bohemia), who as reporter on behalf of the Committee undertook to explain the collateral questions to be considered in connexion with the different parts of the main question, observed that although the interests of the flax growers and producers were so to speak synonymous with those of the flax consumer and the manufacturer, and although both branches, flax culture and flax industry, stood in so close a mutual relation to one another that with a healthy development of the one the existence of the other would be secured or endangered, as soon as the production of flax through some cause or other ceased to prosper, the farmer and flax grower had to contend with more difficulties and risks as regards the production of the raw material than the manufacturer had in working the same. Two important natural elements, climate and soil, affected the linen industry, but indirectly as it were. But besides these, capital and labour played a no less important part. The manner in which the farmer cultivated his flax, being more under his control, influences more directly both his own interest and that of the flax industry, but climate and soil and other local circumstances caused in every country, and even in different parts of the same country and on separate farms and estates, a variety in the methods of culture which was not in every case satisfactory. Besides the preference for old modes and habits and an aversion to innovations, and consequently want of knowledge, were the cause that with few exceptions the culture of flax was in our time almost just as empirical as hundreds of years ago.

Where by nature local circumstances were favourable for the culture of flax, as was pre-eminently the case in Belgium, it was natural that a greater degree of intelligence was bestowed by the growers on the production of flax, which was the same time fostered and supported by the Government.

Passing in review all methods of flax culture at present in use with the same object, namely, that of producing a good valuable fibre, which have established in the different countries of Europe a well-earned reputation, every one of them could be traced back to the original method of culture, viz., that of Belgium, of which they were more or less imitations, adapted, of course, to local and other economic circumstances.

Professor Leydheker, therefore, invited the Congress to pass the following resolutions:—

"1. Of the many varied systems of cultivation, of preparing the field, of sowing and harvesting in practice, those prevailing in Belgium, and especially in East and West Flanders, must be qualified as the most eligible for the production of flax.

"Of the several seed-times (early, late, and autumn sowing) preference should in general be given to early sowing, with especial regard to the production of a strong fibre.

"Sowing flax seed for a second crop is not to be recommended, since it yields a fibre of inferior strength."

"2. On the subject of manure, so important a matter in flax cultivation, there is this to be said: stable dung should only be used for the crop preceding flax; artificial manures, on the other hand, such as ashes, compost, phosphates, or Chili nitre, may, with great advantage be applied directly to the linseed.

"Manuring the ground with unmixed lime is not to be recommended, because it produces a coarse fibre, and the lime dust is troublesome to the labourers, especially in the process of hackling or scutching."

"3. Careful cleaning of the ground and repeated weedings are to be urgently recommended."

"4. Propping the plants, which is done with advantage in cultivating the *lin ramé,* is only profitable with fibres of intrinsic value as such. Propping up flax that has been layed is not very practicable on large plots, and it seems to be more profitable to proceed to early reaping."

" 5. It seems best, instead of spreading the flax on the field, to dry it by laying it out on trestles, and to separate the seed bolls from the stalks by " rippling" instead of using other customary methods for the purpose."

" 6. As advisable measures forpropagating more practical methods of flax culture are to be recommended :—
'awarding prizes for successful cultivation of flax, and especially of good sowing seed;

" Laying down model fields;

" Comparative experiments in cultivating and manuring, and verbal and printed publication of the results."

In the discussion which ensued on these resolutions, the reporter, Professor Leydheker, with special reference to resolution 2, animadverted upon the shortcomings of science in assisting the farmer and flax grower of clearly understanding the chemical properties of the soil suitable for the culture and nourishment of the flax plant to bring it to better perfection. All experiments of improving the soil for flax were as yet mostly based only on empiricism, instead of on scientific data.

Director Wessely, of Prince Schwarzenberg's mines and estates in Schwarzbach (Bohemia), gave a brief and interesting account of experiments made by himself in 1869 with artificial manures for flax cultivation, consisting of a mixture of gypsum with guano, guano alone, animal charcoal, mixed with guano, animal charcoal alone, and animal charcoal mixed with sulphite of potash. The result of these experiments was, by taking plots of ground commonly manured in autumn with half the quantity as a basis, which yielded per joch* only 50 cwt.; that that manured with salt of lime and guano yielded 61 cwt.; with guano alone, 60 cwt.; with animal charcoal mixed with guano, 69 cwt.; with animal charcoal alone, 56 cwt., and that manured with animal charcoal mixed with sulphite of potash yielded 68 cwt. per joch, a proof that phosphates and potassic salts chiefly contribute to improve the produce of flax.

After a lengthy discussion in which a great number of members took part, the resolutions proposed by the reporter in regard to Question II. were, with some slight modifications which are inserted in the text, adopted unanimously.

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* A "joch" is equal to 1,600 square fathoms, or 1·42 acre = 0·576 hectare.

At the second meeting which was held on the 20th August, the Congress proceeded to the consideration of the third question of the programme :—

"WHAT SYSTEMS OF PREPARING FLAX HAVE PROVED SUCCESSFUL, AND OUGHT THEREFORE TO BE RECOMMENDED?"

The introduction and substantiation of this question had originally been entrusted by the Committee to Councillor Kaselowsky, of Bielefeld, President of the German-Austrian Linen Industry Association, but being prevented by illness to attend, Dr. Hermann Grothe, of Berlin (at the request of the Committee), undertook the task, who, in view of the different systems prevailing in the preparation of flax, and giving credit to the British Marine for having by a series of experiments in the use of tows established the knowledge of distinguishing between tows made of retted and of unretted flax, invited discussion on the following propositions :—

"1. Among the systems hitherto adopted those only have proved practically successful by which the straw is subjected to a process of fermentation (by steeping or retting) before the separation of the spinning fibre from the woody substance is effected by breaking and scutching.

"2. Of the processes in use for steeping or retting flax, water steeping, as it is practised in the neighbourhood of Courtrai on the Lys, yields the best results. The same process can be imitated without great difficulty in other localities, and is to be urgently recommended. The permanent Committee will be charged to consider and determine the modifications required in particular countries.

"3. It is advisable to erect good steeping establishments at the cost of communities or corporations, in order that the small producers of flax may have a share in the benefits of them for an adequate payment.

"4. Hand labour in breaking and scutching the flax will have to be supplied by machinery.

"The Congress testifies that machinery can be applied with advantage, and is to be recommended even for the production of the finest and best quality of flax.

"5. Public scutching mills, such as exist in Ireland in great numbers, will materially assist and increase the production of flax. These can be established and maintained at far less expense than factories for dressing flax, and their general extension must be regarded as a step in advance, and promoted as much as possible.

"6. The introduction of the Belgian method of preparing the flax is advisable for hand labour; this can be supplemented by the establishment of breaking and scutching mills or, as the case may be, by the use of scutching machines."

A great diversity of opinion was manifested in the discussion of the preceding propositions, especially the 3rd, 4th, and 5th, as regards the employment of machines in preference to hand labour, and the establishment of public steeping establishments and scutching mills. Mr. Michael Andrews, Secretary of the Irish Flax Supply Association, Belfast, advocated in particular the introduction of an artificial process of retting as a valuable auxiliary in the dressing of the fibre in countries less favoured than Belgium and Holland as to climate and skill in the handling of flax.

The reporter having on behalf of the Committee replied to the points of opposition raised, the different propositions were put to the vote and passed.

In addition the President, Mr. Oberleithner, submitted to the Congress the following motion:—

"In order to have an opportunity of comparing the practicability and performance of the various flax dressing machines shown in the Exhibition, it is proposed to elect at the commencement of next meeting a committee of five members for the purpose of examining and trying such machines."

Which was unanimously adopted.

In accordance with this resolution, Professor Stebutt, of Moscow, Alderman von Pannewitz, of Paulsdorf (Silesia), and his deputy, Mr. George Kriegsmann, landed proprietor of Ranzau, near Wolmar; Mr. Michael Andrews, Secretary of the Irish Flax Supply Association at Belfast; factory director, Leopold Ferra, of Teschen (Austrian Silesia), and Mr. Ignaz Ettrich, spinning mill proprietor of Trautenau (Bohemia), were elected at the third meeting of the Congress, held on the 21st August, members of this committee, at whose disposal a sufficient quantity of retted flax was placed by the Agricultural Society of Moravian Schönberg, and from the Collective Flax Exhibition of the Government of Pskow (Russia); and on the proposition of aulic councillor Dr. Migerka, it was resolved to instruct the permanent Committee to publish and distribute among the members of the Congress in a separate pamphlet, the result of the Committee's examination and trials of the exhibited flax dressing machines.

The next question of the programme for discussion was—

IV. "WHAT DEFECTS EXIST IN THE FLAX TRADE AT PRESENT? and—
BY WHAT MEANS ARE THESE DEFECTS TO BE REMEDIED?"

Mr. Henry Morel, Secretary of the Society "De la Lys" in Ghent (Belgium), to whom the elucidation of this question had been entrusted, was prevented from being present at the meeting of the Congress, and had, consequently, forwarded a report which was read by director Flandorffer, of which the following is a translation:—

REPORT UPON QUESTION IV.

"WHAT ARE THE DEFECTS IN THE FLAX TRADE, AND BY WHAT MEANS CAN THESE DEFECTS BE REMEDIED?

"The Belgian spinners repeatedly met to consider the defects in the flax trade, and to advise means either to remedy or to remove them. In several directions their efforts succeeded. A complete succes, however, it was impossible to achieve on account of the want of agreement with foreign spinners. A Congress like the present ought therefore to be welcomed. Buyers and sellers appear to be equally interested in the question of the progress and extension of the flax trade. To both the improvement of the flax culture must be a matter of the greatest consequence.

I must in the first instance observe that here we have to take into consideration only the raw material which we use. This will explain why I shall only speak of Belgium, Holland, and Russia. Nevertheless, I have no doubt that my observations may also apply, to a certain extent at least, to the flax produced in other countries, and that one or the other of our colleagues in the Congress will be ready to supplement my remarks.

The flax trade in general is suffering from three evils—

1st. From fraud; as for instance:
  (*a.*) Insufficient cleaning of the inner parts of the flax beets or bundles;
  (*b.*) Admixture of flax waste, inferior qualities, and even other substances, such as stones, &c.;
  (*c.*) Soaking of the flax in order to increase its height;
  (*d.*) Practices in general which tend to furnish an article inferior to that bargained for.

2. From unequal assortment, consisting principally in mixing several qualities together which are delivered under the same mark or description.
3. From the degeneration of recognised marks where they exist. Hereby I mean the creation of fresh marks allegedly superior to the disadvantage of the existing ones; the purchaser often receiving to his surprise a class of goods which does not respond at all to the expectations he had formed from the mark chosen.

To the first class of these evils must be counted a great many of those mal-practices which have in some places augmented in a deplorable manner. Experience has proved that the strongest representations were without effect. Unfortunately the spinner is very often not in a position to protect himself by refusing to accept the adulterated article and placing it at the sender's disposal, for in most cases the purchaser has allowed the seller to draw upon him in advance from abroad, and even if he obtained at home a judgment in his favour it has only a negative value, as it cannot be put in force abroad.

A somewhat more effective means would be found in a common or combined procedure of the merchants. Thus, in order to mention an example, in Riga, last year, in consequence of the pressure on the part of the Belgian spinners, the committee of the exchange of that place decided to take certain preventive measures. But whether the good results already obtained will be lasting is a question which may be doubted. To this must be added that the sources from which the flax is obtained are numerous and scattered, and that there is not in every place a central committee, which has the power to check the abuses.

Beneficial as the common action of the buyers can be rendered, it appears to me that it would be very desirable that in those flax-growing districts where there are no leading committees, they should be formed as soon as possible.

In order to render the action of such committees more effective I am of opinion that examination and supervision at the place of export ought to be facilitated. By this precaution disappointment on the part of the purchaser would be prevented, and the seller deprived of the pretext of ignorance when supplying spinners as agents or brokers of the growers.

In this respect I consider it most important that a uniform system of packing should be everywhere adopted by which the examination of the contents would be facilitated, and the admixture of inferior qualities and other foreign substances with the flax prevented, or at least rendered more difficult. The Belgian mode of tieing the flax has, with the exception of the wetting, put a stop to all other defraudations. I do not at all insist upon a strictly formal uniformity in the mode of packing, I am quite satisfied when thereby the objects herebefore mentioned are obtained.

The second class of evils extends to the inequality in sorting in those places where there are no official, or at least no generally recognised marks. Wherever there are no marks at all, as in Belgium and Holland, these evils are less felt, as the spinners when making their purchases take care themselves that the sorting be done uniformly.

It must be admitted that foreign purchasers may possibly complain of the sorting of Belgian or Dutch flax; but they can scarcely have any reason to desire to bring the old marks, which were introduced by the English purchasers again into use, which, however, could be done, if the necessity for doing so was generally recognised.

In Russia, on the other hand, a re-organisation of the marks seems to be absolutely necessary. Their numbers must be diminished, and a rigorous distinction made between the classes introduced, which now is entirely wanting. The marks should be reduced to two, or at the most three, and besides, in consideration of the difference of the districts where the flax is cultivated, the quality should be also designated.

The disadvantages of too many marks are best illustrated by the state of the flax trade in Russia, where many of the sorts marked "K" (crown) should come into the market as second and third mark under the designation "W" (Wracks).

It is just in Russia, this great flax-producing country, where the earliest possible introduction of committees is most desirable, as well as that these committees should act in close union in the same direction. The classification should be very simple, but sustained with the greatest rigidity. The division of the different flax sorts of the same district into two or three classes will not be difficult. The knowledge of a workman well acquainted with the breaking of flax will in most cases be sufficient. More difficult is the classification of scutched and dressed flax, which in almost all spinning establishments is entrusted to workmen of equal, and certainly not superior abilities.

I must, however, confess that I consider an absolutely uniform classification, or more correctly speaking, a uniform notation of the innumerable varieties of flax sorts an impossible performance.

In regard to the third class of the above-mentioned evils, the continued creation of new marks, which reduce former recognised marks to a designation of an inferior article, is an evil which above all things ought to be removed first. In Russia this abuse has been extended so far that I have not the slightest hesitation to declare that the flax sorts commonly marked as "Crown" (K) and even sorts classified higher, are of a quality which were, in the official classification formerly marked as "Wracks" (W). As regards these latter sorts, it is a characteristic phenomenon worth noticing here, that in spite of the generally known fact of the continually diminishing intrinsic worth of flax, they have now entirely disappeared from the market; they have simply been assimilated to the higher marked sorts of flax.

Another phenomenon, which reveals the diminution in value of even the existing marks, is that Russian and East Prussian summer flax is inferior to winter flax, or in other words, that fresh flax, as a rule, is worth more.

It has also been noticed, as a matter of fact, that all flax, whatever may be its native soil, will periodically deteriorate.

After due consideration I can find only one remedy against the recurrence of this calamity, that is, the selection of normal flax samples at the commencement of each harvest to be sent to the places of consumption in order to enable buyers to make comparisons during the year.

These samples should be supplied in a certain quantity in order to make it possible to find out their marks. They should be sent out by the committees or their substitutes.

These samples should be received by the chambers of commerce, societies of spinners, or other similar associations, to be kept by them, and be accessible to all persons interested in this subject.

The committees which supply these normal samples must, of course, keep duplicates in order that the sellers may be likewise enabled to make comparisons. For Belgium, for instance, it would be sufficient if Riga were to send only half a dozen of its marks as samples.

To conclude this *exposé* of the evils of the flax trade, I have a few more points to mention, viz.:—

(*a.*) The tare weight.

(*b.*) The net weight.

(*c.*) The responsibility of the railways in regard to weight.

In regard to the tare, it seems to me, that as all conventional tare after a certain time was invariably abused, the plan to be recommended would be to keep to the real tare, that is to say, to pay the flax according to its *net* weight, and the packing according to the price agreed upon.

As to the net weight, it seems to me as little reasonable to demand from the seller to deliver over and above the quantity accounted for, as to relinquish the right to insist upon delivery of a correct weight within the limits of the quantity charged for. It appears to me that a pretty near approach to the weight charged in the account can be maintained, and we Belgian spinners are in a position to testify this fact.

Railway companies in general, but especially the International Russo-German Company, refuse to undertake any responsibility as to weight, or the numbers of packages in case the senders load the waggons themselves.

It is in the interest of the trade on account of the gain in time and expense that this proceeding (the loading of the waggons by the senders) should be preserved; neither can any objection be made to the refusal of such responsibility provided the packages arrive at their destination without being opened.

Although the railway authorities cannot be made answerable for the weight declared in the bill of lading, in regard to the number of packages, considering how easily they can be controlled, they can be made responsible for the correct delivery. As this principle is a very just one, the flax committees ought to endeavour to have it acknowledged and carried out everywhere.

To summarize the preceding remarks, I have the honour to propose the following resolutions, the realisation of which if they will not entirely remove all the evils which embarrass the flax trade, will at least tend to diminish them to a great extent.

"1st. *The election of committees in every flax-growing district composed of eminent merchants and manufacturers.*

"It should be the task of such committees to regulate the flax trade by attending to the introduction of such measures as are best calculated to prevent fraud, to conserve the existing marks, to insist upon a uniform sorting, &c. &c.

"The election of such committees to be left to the parties interested in each district.

"The different committees should enter into communication with each other in order to be able to act conjointly in certain cases if required.

"At the commencement of the harvest they will have to classify and to sort the flax grown in their district, and to make and forward samples to the respective flax committees or in case of no such existing, to the chambers of commerce of the consuming districts. Duplicates of the samples should be kept in the place, in order to control the conformity of the goods with the samples.

"'*2nd. The election of committees in the districts of consumption.*"

"They would have to take care of the interests of the consumers, and to preserve the samples sent from the flax-growing districts. If in a district flax is produced *and* consumed, the same committee could extend their activity both ways.

"3rd. In all flax-growing districts a system of packing ought to be adopted which allows by simple inspection a comparison of the conformity of the exterior with the contents. Without considering a uniform packing system to be absolutely necessary, I wish to direct attention to the Flemish mode of packing.

"4th. Introduction of a real tare.

"5th. In cases when the flax is sent by the exporter, the railway companies should be made responsible for the number of packages, and should the packages have been opened before their arrival at the place of destination, they should likewise be held responsible for the weight.

"The best protection, however, against the above-mentioned and any future evils will be a continued friendly understanding among the spinners. May the Congress in Vienna lead to the commencement of such relations and give them the desired stability."

Vice-President Hirt in moving the adoption of this report and a vote of thanks to its author, M. Morel, observed, it was desirable that the Congress voted a fixed division into three sorts, to include all variations.

No. 1, "Kron" (Crown), should apply to firm flax; No. 2 to middle firm, and No. 3 to the inferior sorts or waste, possessing no firmness. If these three sorts or divisions were fixed upon, it would be sufficient to add fine quality, whiteness, and pureness. If for instance it was said, here is "Kron," which is fine, pure, and white, everyone would know that this was a sort of flax by which at least 25 per cent. profit could be made. If the sorts were once fixed and known, samples would no longer be necessary.

Mr. Flandorffer communicated from No. 186, of the Journal of Linen Industry of the 1st June 1872, the result of a meeting of Belgian spinners, held at Ghent in May 1871, which was:

"1. Restriction and exact denomination of the marks for Crown flax. By No. 1 of these marks only the very best produce of the Russian flax harvest should be distinguished.

"2. Uniformity of the flax classified by the same mark, and no addition of an inferior sort. Prohibition of all fraud.

"3. Allowance of the real tare weight *to the purchaser*. Charge of the correct value for cordage, packings, &c.

"4. The Russian firms as well as their customers agree to settle all differences in the following manner:—

  (*a.*) "Each, the purchaser and the seller, nominates an experienced referee, whose decision they both engage in advance to abide by;

  (*b.*) "In case these two arbitrators should not be able to agree, the tribunal of commerce of the district appoints an umpire against whose decision no appeal is allowed.

"5. The Russian firms take for the purposes of business their domicile in Ghent.

"6. The spinners whose names are appended to these resolutions engage to maintain no business connexions with any Russian flax dealer who objects to agree to and sign these conditions.

"7. They undertake to communicate their propositions also to foreign spinners, in order to bring about a common agreement among all flax consumers."

Mr. Flandorffer then communicated to the Congress also the new classification of the Russian flax sorts from No. 207 of the Journal of Linen Industry, of the 26th October 1872, which is as follows:—

The general meeting of merchants and dealers in flax has resolved at Riga, on the 24th August 1872:

"1. In altering chapter II., § 3, sect. C of the Exchange Usances, to reduce in regard to 'wracked' (*i.e.*, sorted) goods, the private flax assortment in use in addition to the sign of the published 'wracks,'[*] to the following marks:—

"Crown Flax."

K 1. Common crown;
PK 1. Puik crown;
SPK 1. Superior puik crown.

"Wrack (sorted) Flax."

W 2. Common wrack;
PW 2. Puik wrack.

"Three-band Flax."

D 3. Common three-band;
PD 3. Puik three-band;
SD 3. Slonez three-band;
PSD 3. Puik slonez three-band.

"Livonian Flax."

HD 2. Common Hofsthree-band;
PHD 2. Puik Hofsthree-band;
PPHD 2. Fine puik Hofsthree-band;
SFPHD 2. Superfine puik Hofsthree-band;
LD 3. Common Livonian three-band;
PLD 3. Puik Livonian three-band.

"Flax Tow."

H 1. Common flax tow;
H 2. Red flax tow;
SH 2. Slonez tow;
PH 2. Puik tow.

In addition to which the marking of the colours H, G, and W with crown, G and W with wrack, and W with Livonian goods is to be maintained.

"2. To institute a jury, formed of two merchants trading beyond the seas, two merchants of produce, two after-wrackers (sub-sorters), and the town's chief wracker (sorter), who shall—

(*a.*) Fix in December every year the typical samples for the private assortments;

(*b.*) Decide the differences arising between sellers and buyers, whether the delivered goods correspond with the typical samples, and,

(*c.*) To bring to the knowledge of the tribunal (Wettgericht), irregularities and defects of the public wracks. The jury must also in fixing the typical samples, add to their number two town wrackers (sorters) entitled to vote.

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[*] The signs of the public "wracks" (sorts) are marked in red in addition to the black coloured private marks; with flax packed in matting, and with flax packed in bobbins, they are marked on little boards by burning.

"3. Foreign purchasers shall in future be always allowed the actual tare weight, with flax packed in bobbins as well as in matting, sect. g and h of § 3, chap. II. of the Usances being altered accordingly.

"The above stipulations shall come in force from the 1st November 1872."

After some remarks from Mr. Andrews, of Belfast, to the effect that many of the defects in the flax trade arose from imperfect handling, and consequently imperfect dressing, the removal of which would be effected by the improvement of these two operations, and that the want of uniformity as to quality in packing flax in the bales was very prejudicial to its sale, the Congress, taking into consideration the importance and extensive range of this special subject, resolved in reference to question IV of the programme,—

"To leave to the permanent committee the inquiry into the defects of the flax trade, and also as regards the measures to be adopted for their removal; but records its thanks to a Mr. Morel for the thorough preliminary inquiry and the suggestions he has made towards answering this question."

Mr. Michael Andrews, the delegate and secretary of the Flax Supply Association, in Belfast, thereupon delivered in English the following discourse on artificial retting, which was translated into German to the Congress by Dr. Weinmann, and inserted in the official report of the proceedings of the Congress.

"Hitherto the retting of flax by artificial means has not proved satisfactory. The application of chemical agents to separate the fibre from the shove has been unproductive of favourable results. Schenk's process of retting flax at a high temperature, by the introduction of steam into the vats in which the flax is contained, attracted at one time considerable attention, but the fibre produced, although possessing many outward appearances of merit, was deficient in those qualities necessary to the spinners.

"Watts' patent was a modification of Schenk's, and consisted in introducing steam into close chambers in which the flax was placed. This also failed, and the large establishments which were constructed for carrying on the operations were converted to other purposes.

"The end aimed at by these methods was to effect the separation of the flax fibre from the shove, and thus do away with the present very uncertain and precarious mode practised by each individual farmer who is entirely dependent upon the weather during the steeping of his flax in the ordinary open air dams, which are subject to all the vicissitudes of temperature which occur at the season of the year when the flax crop arrives at maturity.

"While the manipulation of flax subsequent to being pulled remains in the hands of farmers, who are not only liable to the uncertainty before mentioned, but in many cases are ignorant of the various operations, the present preponderance of ill-handled flax will exist.

"From past experience any artificial method of treating flax is naturally viewed by those interested with disfavour and distrust, but the large proportion of indifferently handled flax which is produced in many flax-growing countries would cause any practical and efficient artificial method to be productive of very great advantage.

"The idea occurred to me some years since that the most promising system would be to endeavour to imitate the best results attained by the ordinary methods under the most favourable circumstances.

"To attain this the mode that suggested itself to me was to adapt some means of retting flax at a uniform permanent and moderate temperature, and it also appeared to me that under Shenck's and Watts' process this desired condition could not be attained, in fact, in dealing with steam at a considerable pressure the flax would be liable to danger from overheating so long as steam as a heating medium was introduced directly into the vats in which the flax was placed, and the method to insure safety would be to put the flax in vats contained in chambers heated by steam pipes, the water being introduced into the vats at the required temperature, and this temperature maintained by heating the surrounding atmosphere of the chambers. In other words, simply by creating an artificial climate.

"By this arrangement I considered that uniformity of temperature of any required degree could be attained, as the vat containing the flax would be slow in sympathising with the fluctuations which might accidentally occur in the temperature of the chamber.

"For the purpose of testing this theory a miniature rettery filled up with the necessary appliances was constructed.

"The chamber in which the vat was situated is 14 feet long by 10 feet wide and 8 feet high, and the vat was sufficient to contain about 50 and 60 tes. dried flax straw. It was heated with pipes supplied by steam, and water of about 7° of hardness was available for retting and washing the flax.

"The flax straw was placed in the vat in a perpendicular position in butts loosely tied, the butts and taps being reversed in each row. Blue clay was placed in the bottom of the vat.

"It is unnecessary to detail the methods which were used to confine the flax in the vat. The steam which supplied the heating pipes was under control by means of a stop-cord.

"It now only remains to describe the results which were obtained which in practice were more favourable that were anticipated, and the facility of maintaining what is so essential, viz., a uniform temperature was accomplished.

"When the temperature of the chamber rose very much beyond that of the vat the latter for a considerable time was but slightly affected, owing to the tardiness of the vat sympathising with the temperature of the air in the chamber. On the other hand, when the temperature of the chamber fell considerably below that of the vat the latter was very slightly influenced.

"To exemplify this more clearly an excess of steam was admitted, and the temperature of the chamber rose from 80° to 99°, and remained at this point for some time, but the vat did not go beyond 80°, and the steam was then cut off. On another occasion the steam was cut off entirely, and the temperature of the chamber fell from 75° to 63° during the night, whereas the vat only fell from 70° to 90° during the same time. These particulars are dwelt upon at length as on this fact depends the most important feature in the whole system, viz.: The protection of the flax straw during the retting process from undue heat which would endanger the quality of the fibre, or an undue chill which would check the fermentation.

"The fermentation is in full vigour in 24 hours, and continues uniformly for some days, when it gradually subsides as the operation approaches being completed.

"It may be remarked that the superiority claimed for this method of retting flax over what is known as the 'hot water steeping' is uniformity of temperature; in fact, these experiments have demonstrated that an absolute control can be exercised over the means adapted to produce the artificial climate in which the vats containing the flax are situated.

"One of 'Six's' combined maximum and minimum thermometers is placed in the chamber, and one immersed in the vat; so the relative temperatures can at any time be observed.

"The temperature at which the experiments were made varied from 72° to 79°, and the retting process occupied from six to 10 days, but it may be observed that hastening the process by raising the temperature has the tendency of reducing the strength of the fibre.

"The flax after leaving the vat was washed, and part passed through iron rollers previous to being dried. To detail all these results would occupy too much time, but the inference which I have drawn from them is that there is much yet to be developed before the handling of flax has attained that degree of perfection which it will when the retting has been reduced to a manufacturing process.

"In the year 1869 I introduced this subject into the second issue of instructions for the culture and preparation of flax in Ireland. Before this pamphlet, however, was in print I observed in the annual report of the Royal Society for the Promotion and Improvement of the Growth of Flax in Ireland, that M. Reuter, of Vienna, had adapted this system, and that several retteries on the plan had been erected in Austria. My idea, therefore, was not a new one, however I had never before seen description of artificial retting being done otherwise than by introducing the steam directly into the vats in which the flax was contained.

"I made great exertion to ascertain what the result of these retteries were but till recently was unable to gain any information.

"Through the kindness of M. Jos. Peter I have ascertained that technically the system was a success, but commercially it proved a failure. M. Jos. Peter also mentioned that it was found that favourable results could only be obtained during the season when flax would ret to advantage in the open air dams, but this I am inclined to think must have arisen from some inadvertence, as I have taken special pains to test the system under every condition of season and natural temperature.

"During last winter, when the ground was covered with snow and the temperature below freezing point, I renewed my operations in my small rettery, and I can testify that the results were equally satisfactory to those I had previously attained, in fact rather more so, which I attribute to an increased knowledge, gained by experience, in the working out of the system.

"One of the chief advantages attending a successful artificial mode of retting flax would be that a concentration of skill could be brought into operation, and that the process could be pursued continuously during the entire season.

"There are other matters connected with this subject which would require attention, and which in practice might give rise to some difficulty.

"1. Drying the flax straw in the field after being pulled in such a manner as to preserve uniform colour. The countries in which an artificial mode of retting would be attended with the greatest advantage are generally subject to vicissitudes of climate, which would sometimes interfere with this operation which could only be done in the open air.

"2. Provision would require to be made for drying artificially after being retted, in case the weather would not admit of this operation being performed in the open air.

"3. In erecting retteries it would be imperative to ascertain that the supply of water would be ample and of a nature suitable for the retting process; also that a supply of flax would be available at a reasonable distance from the factory.

"The experiments made were numerous, but percentage results were not noted in every instance, and a considerable quantity of retted straw still remains unscutched.

"One feature was observed, that the flax was not so liable to injury from over-retting as under the ordinary method of open air green steeping, and the temperature could with advantage be varied to suit different descriptions of straw.

"The following is an average of the yield of three experiments.

Average loss converting dried straw into retted	23·70	per cent.
Average yield of retted straw from dried	76·27	„
Average yield of fibre from retted straw	23·53	„
Average yield of fibre from wind straw	18·18	„

Average time occupied in retting about 6½ days.

Average maximum temperature	75·0	degrees.
Average minimum temperature	72·16	„

"In these experiments the temperature of the chamber and that of the vat varied considerably as the operation being new complete command was not attained of the heating medium, but in subsequent experiments almost absolute uniformity between the heat of the chamber and that of the vat was produced. Sometimes for days it would not vary more than a degree or two.

"The results in practice verified the theory in every particular and technically I believe there are no barriers which cannot be surmounted, but the question yet remains to be solved if the enterprise commercially would prove a success."

The President in the name of the Congress expressed to Mr. Andrews their thanks for his very able and interesting discourse.

The Congress then passed to the consideration of question V. of the programme.

"WHAT ARE THE WAYS AND MEANS FOR IMPROVING AND INCREASING THE CULTIVATION OF FLAX, AND FOR PROMOTING A BETTER REALISATION OF THE FLAX PRODUCTS?"

Mr. Carl Oberleithner, in introducing this question alluded to the exertions frequently made by governments, corporations and societies for improving and extending the cultivation of flax, though not always attended by favourable results, the cause of which failure, in his opinion, must be attributed to a misconception of the nature of the means employed, and partly to a faulty application of principles, albeit sound in themselves.

To remove as far as possible the impediments to a successful and profitable culture of flax and of the flax trade, and to devise practical means to achieve this object was chiefly the task of this International Congress. An urgent necessity clearly existed for the flax growing countries to devote more attention than hitherto to the growth of flax seed for sowing. The methods of cultivation in use, and the preparation of flax likewise merited all the more consideration as the complaint of the deterioration in the dressing was becoming more general. Although admitting that self-help was the highest principle of humanity and society, yet support by the State in an important branch of agriculture and industry like this with which the Congress had been occupying itself could hardly be dispensed with. Flax growers and flax consumers must work hand in hand, and if the support of corporations and governments judiciously applied be added to assist them in their exertions, progress will be inevitable. But science also, and the press can contribute their share to the promotion of the object in view. Various manipulations employed in the culture of flax are very expensive and still very primitive. It is the intention to appoint an international organ whose mission it shall be to establish combined action, and to act as a medium between those interested in the promotion and improvement of the flax culture, and those whose duty and interest it is to advance the cultivation of flax by material support. The assistance expected at the hands of the Governments should consist,—

1. In the establishment of flax preparing schools.
2. In the grant of travelling stipends to flax growers and itinerant teachers.
3. In the promotion of the establishment of flax growing model farms and flax dressing mills, by means of loans free of interest, and repayable by annual instalments, and exemption from rates and taxes.
4. In the distribution of government prizes for the best results achieved in the culture and preparation of flax; for improvements in the cultivation and dressing methods, for greater economy in the spinning process, and attainment of higher numbers of fine yarn from the same spinning material.
5. In the purchase of machines and implements for distribution among flax growers, dressers, and spinners.
6. In the endowment of special lecturers and instructors in mechanical spinning and weaving at polytechnical institutions and industrial schools.
7. In the promotion of periodical exhibitions.
8. In the protection of the marks of producers and traders.
9. In the establishment of cheap transport tariffs.
10. In the appointment of consulates in the flax growing districts and the chief commercial centres, combined with quick publication of the consular reports.
11. In favouring contracts for the supply of army, navy, &c., with articles manufactured of flax.
12. In the promotion of free trade in regard to flax and flax products, and the introduction of uniform statistics as to the production and consumption of flax.

In connection with these explanations Mr. Oberleithner proposed the adoption of the following resolutions to question V. of the programme:—

"1. The improvement of flax cultivation has been attempted in many ways and often with great sacrifices by governments, associations, and private persons, but in many instances without satisfying reasonable expectations as regards the result."

"The Congress testifies that the explanation of these facts is to be found partly in a misconception of the nature of the means employed, and partly in a faulty application of principles sound in themselves."

"2. The most effectual way to support the measures of the Governments and the efforts of societies and individuals appears to the Congress to be: To establish an international corporation, which should consist of a managing committee changing its locality every year, and of members in all the states interested in the cultivation of flax, and should recognise as its mission the promotion of the improvement of the flax culture, and the introduction of better means of realising the market value of this article, and should fulfil that mission by obtaining the aid of science and the press in the way of instruction, by supporting practical endeavours, and, when necessary, by bringing about the enactment of special laws on the subject."

After the unanimous adoption of these propositions the Congress proceeded to the election of the members of the Permanent Committee in accordance with the last resolution, and § 3 of the Rules of Proceedings (Appendix D.), with instruction to collect materials and prepare everything necessary for the next meeting of the Congress.

The following are the members elected to form the Permanent Committee.

From America.

Dr. Collyer, Engineer, United States of North America.

From Austria.

Ettrich, Ignaz, spinning mill proprietor at Oberaltstadt near Trautenau, Bohemia.

Fedra, Leopold, Archducal factory director at Teschen, Silesia.

Flandorffer, Carl, director of the flax factory at Hannsdorf, Moravia.

Foltz, Carl, Councillor at Linz, Upper Austria.

Chevalier Von Hamm, William, Imperial and Royal Aulic Councillor at Vienna.

Hofmann, F. W., Economic Councillor at Vienna.

Baron Von Hohenbruck, Arthur, Imperial and Royal Ministerial Councillor at Vienna.

Von Hudec, Wenzel, landed proprietor at Brodky in Galicia.

Janig, domain director at Reichenberg, Bohemia.
Jerie, W., spinning mill proprietor at Hohenelbe, Bohemia.
Jesse, William, Archducal Estates Administrator at Vienna.
Kotnig, Carl, landed proprietor at Oberlaibach, Carniola.
Langie, Carl, delegate of the Agricultural Society at Cracow, Galicia.
Oberleithner, Carl, Chairman of the Agricultural Society and factory proprietor at Moravian Schönberg.
Peter, Josef, Imperial and Royal district captain at Vienna.
Baron Von Petrinó Otto, landed proprietor at Okna, Bukowina.
Raymann, Adolf, factory proprietor at Freiwaldau, Silesia.
Schütz, Kosmas, Secretary of the Imperial and Royal Carinthian Agricultural Society at Klagenfurt.
Chevalier Von Storowiciski, Stanislaus, landed proprietor at Brodkuwka, Galicia.
Trientl, P., chaplain at Hall, Tyrol.
Ullmann, Alois, flax dealer at Iglau, Moravia.
Wessely, Prince Schwarzenberg's mining director at Schwarzbach, Bohemia.

From Belgium.

Hennebert, A., Conseiller provincial à Colles (Hainaut).
Morel, H., director of the flax spinning factory La Lys in Ghent.
Müller, A., negociant at Antwerp.
Ritter, Fritz, spinning mill proprietor at Roulers.

From Germany.

Dr. Eras, Secretary of the Chamber of Commerce at Breslau.
Dr. H. Grothe, member of the German and Austrian Linen Industry Association at Bielefeld, of Berlin.
Hirt, Robert, flax spinning mill proprietor at Freiberg in Saxony.
Kaselowsky, Ferdinand, president of the German and Austrian Linen Industry Association at Bielefeld.
Von Kliting, alderman at Schyrowka at Prussian Silesia.
Liedtke, F. W., at Könisberg, Prussia.
Mittnacht, alderman at Kleinlassowitz.
Dr. Möller, R., at Brackwede near Bielefeld.
Müller, H., flax spinning mill proprietor at Hirschfeld near Zittau, Saxony.
Münzner, Chief Economic Commission Councillor at Freiberg.
V. Pannewitz, alderman in Paulsdorf, Upper Silesia.

Sison, Robert, Royal Domain Director at Pirna on the Elbe in Saxony.
Sonntag, Carl, Director-General of the Flax Cultivation Society at Berlin.
V. Watzdorf, landed proprietor at Schönfeld.

From Great Britain.

Andrews, Michael, Secretary of the Flax Supply Association in Belfast.
Ewart, William, spinning mill proprietor in Belfast.
Mulholland, John, president of the Flax Supply Association in Belfast.
Richardson, James N., jr., Belfast.
Savage, Sir John, and
Valentine, Thomas, Belfast.
Dr Weinmann, Fr. L., Reporter of the Royal British Commission of the Vienna Exhibition, of London.

From France.

Legrand, Simon, Bersée.
Scrive, Lille.

From Holland.

Van Acken, president of the Netherland Society for the Promotion of Flax Industry at Rotterdam.
Keurenaer, J. A. major of the Engineers at Delft, near Rotterdam.
Moll, E. C., secretary of the Netherland Society for the Promotion of Flax Industry at Rotterdam.

From Italy.

Dr. Cantoni, G., Director of the Royal High School at Milan.

From Russia.

Bauer, Ferdinand, of Pskow.
Dittrich, Carl, of the firm Hielle and Dittrich, in Schönlinde, Bohemia, and Zèrardowo, Russia.
Le Doct, Domain farmer at Drabowskoja, Government district Poltawa.
Illüen, Nicolas, professor at Petersburg.
Kossoff, Ildefons, Professor at Moscow.
Kriegsmann, George, landed proprietor at Ranzau, near Wolmar, delegate of Livonia.
Lovis, Carl, Professor at the Polytechnic Institution at Riga.
Maximoff, Basil, at Kostroma.
Armistead, of the firm Mitschel, of Riga.

Prince Repnine, at Jagotine.
Stebut, John, professor of agriculture at Moscow.
Tretjakoff, widow, and sons, spinning factory proprietors at Szerpuchow, Government district Moscow.
Baron von Wolff, at Druween.

At the proposition of Aulic Councillor, Dr. Migerka, the Committee were empowered to add to their number, and at that of Mr. Peter it was resolved to convene the next meeting of the International Flax Congress in the City of Ghent, in Belgium.

After a concluding speech by the president, Mr. Oberleithner, and the official delegate of the Director General of the Exhibition, Aulic Councillor Dr. Migerka, thanking the members for their attendance and their labours, the proceedings of the first International Flax Congress terminated with a vote of thanks to the President, the originator of the Congress, and the members of the Preparatory Committee.

FR. L. WEINMANN.

APPENDIX.

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APPENDIX A.

No. 62.

[TRANSLATION.]

VIENNA UNIVERSAL EXHIBITION, 1873.

PROGRAMME OF THE PROPOSED INTERNATIONAL CONGRESS OF FLAX GROWERS, &c., TO BE HELD AT VIENNA ON THE 18TH, 19TH, 20TH AUGUST NEXT YEAR.

The great importance of flax as a profitable agricultural product and valuable raw material for industry renders it a matter of great moment that at the Universal Exhibition at Vienna next year, not only the plant and the staple commodities manufactured therefrom, but also the different modes of manipulation, as well as the implements and machinery employed for obtaining the fibre and dressing it for spinning, &c. should be represented in as complete a manner as possible.

In order to invest this branch of the Exhibition with a practical interest the Imperial Austrian Commission propose to hold during the time of the Exhibition an international Congress of flax growers and spinners, whose business it will be to answer the questions contained in the annexed programme, and to take into consideration the various plans and means adapted to make, on the one hand, the cultivation of flax more remunerative to the agriculturist, and, on the other, to supply to the flax spinner a better and cheaper raw material.

This Congress is intended to be held on the 18th, 19th, and 20th August 1873.

Agriculturists, manufacturers, and merchants who are engaged either in the cultivation and spinning of flax or in the flax trade, as well as men of science and others of works on the cultivation of flax, are hereby invited to take part in the discussions and decisions of this Congress.

Gentlemen desirous of taking part in this Congress are requested to address a notice of their intention, with their name and address, to the Secretary of the Royal British Commission for the Vienna Universal Exhibition of 1873, 41, Parliament Street, London, before the end of April 1873, at the latest.

Cards of admission, bearing the name, &c. of the applicants, will be remitted by the Austrian Director-General of the Vienna Exhibition to the various foreign commissions, whose duty it will be to forward the same to the different persons who have notified their intention of attending the Congress.

A Committee formed of experts will conduct all the preliminary arrangements, and prepare the motions to be submitted to the deliberation of the Congress. The reporters on the various points of the programme will be appointed by the Director-General on the proposition of the Committee.

The Chairman of the Committee will open the first meeting of the members of the Congress, it being reserved to the latter to elect a president and arrange the mode and rules of the proceedings.

The debates of the Congress may be held either in the German, English, French, or Italian languages.

Letters, papers, propositions, &c. having reference to the several points of the programme must be addressed to the Director-General of the Universal Exhibition of 1873 at Vienna by the end of May next year at the latest, and bear on the envelope the remark "For the Congress on Flax Industry."

The proceedings and resolutions of the Congress will be published in due course, and forwarded to the members who have taken part in the same.

PROGRAMME OF QUESTIONS.

I. What knowledge and experience have already been gained in regard to the selection of flax seed and its production for sowing seed, and by what means can the same be improved?

II. What systems for the cultivation of flax are in operation?
Which of them are the best? and,
What means would be the most practical for propagating and extending the application of these methods?

III. What systems employed for the preparation of flax have been found the most advantageous, and ought for that reason to be recommended?

IV. What are the present defects of the flax trade, and by what means can they be removed?

V. What are in general the ways and means for improving and increasing the cultivation of flax, and for promoting a better realization of the flax products?

The Director-General,
(Signed) BARON VON SCHWARZ-SENBORN.

42, Praterstrasse,
Vienna, 24th July 1872.

APPENDIX B.

No. 100.

[TRANSLATION.]

VIENNA UNIVERSAL EXHIBITION, 1873.

INTERNATIONAL CONGRESS OF PERSONS INTERESTED IN THE CULTIVATION OF FLAX.

Explanation and paraphrase of the questions published in programme No. 62.

The great successes of the "Royal Society for the growth and cultivation of Flax in Ireland," as well as of the similar societies in other countries, for the promotion of the growth of flax, furnish irrefutable proof of the beneficial influence which public corporations are able to exert on the cultivation of the soil and on industry.

Flax spinning by machinery in Great Britain increased far beyond the offers of Belgium and Holland, countries producing pure flax; the conditions of labour and gain of the Irish landlord and tenant had become extremely difficult. At this juncture the Royal Society for the growth and cultivation of flax appeared on the scene, procured the farmer a higher yield of his land, and supplied the consumer with material for spinning, which, although not cheaper, was in greater abundance, and even up to recently in sufficient quantity.

What a free association has brought about on the other side of the Channel most of the governments on the continent have endeavoured to attain; all of them, certainly, with the same honest intentions, albeit not always attended with similarly favourable results.

To investigate the causes to which one is compelled to ascribe these comparatively small results of the considerable sacrifices made by governments and private individuals, as well as to become acquainted with the means capable of promoting the growth and cultivation of flax, and to disseminate them generally, is the task which the International Flax Congress endeavours to accomplish.

The importance of the growth and cultivation of flax to the industrial states of Europe is evident from the fact that the supply of flax and tow scarcely suffices to cover the demands of the factories for flax spinning by machinery.

With the exception of Russia, whose export trade is constantly increasing, the cultivation of flax has fallen of in the other countries of Europe during the last few years. The stagnation which has to be recorded in the development of flax-spinning by machinery has been occasioned not only by the competition of kindred species of spinning

fibres, but must also be attributed to the inadequate supply of the raw material reared from linseed.

If it be asked what means can be adopted by which the increase in the supply of flax may be expected, the question arises first of all—

> "*What means exist to render the production of flax-seed for sowing (Säekinsaat) more general?*"

It is a well-known fact that Holland, Eastern Prussia, and above all, Russia, are the chief growers of flax seed for sowing purposes. But the introduction into Russia of flax-spinning by machinery will, at no distant date, probably re-act on the growth of flax seed for sowing in such a manner that attention will be more directed there to the growth of spinning material, than to the rearing of flax seed. In consequence an urgent necessity will arise for other countries to devote more attention and time than hitherto to the growth of flax seed for sowing.

It is therefore desirable that the experiences which have been gained in regard to the selection of flax seed with a view to the production of suitable spinning fibres should become generally known, as well as the results obtained in the various countries, by the flax seed specially grown for sowing. The International Congress will probably be the organ best adapted to thoroughly ventilate and disseminate the experiences which have been gained.

With this is connected the examination and discussion of the different methods of flax cultivation.

These, it is true, depend upon conditions of soil and climate. It is, however, a certainty, that agriculturists cling with great obstinacy to old custom, more especially in this respect. For instance, in some places they retain the narrow beds (ridges), manuring with lime, &c. The Congress will therefore endeavour to find out the established methods of cultivation in the chief countries of flax-cultivation, and make known the best with regard to the particular conditions of soil and climate. The selection of soil, variation of the crops, manuring, tilling of the soil, sowing, rearing of the plant and crop, manner of harvesting, &c., will of course, be discussed in treating of this question.

A third question was raised, namely—

> "*Which methods of preparing flax have been well tried, and are consequently to be recommended?*"

The preparation of flax is equally as important as regards the value of the fibre for spinning as is the selection of the proper flax seed and the cultivation. The great difference in the price of well-dressed flax and flax inferiorily prepared is the most obvious proof of it. Whereas only half the price can be obtained for flax badly dressed by the same method of retting, it is possible to obtain the quadruple price when good steeping has been employed.

The Congress will, accordingly, have to institute an inquiry concerning the various methods of preparing flax with regard to the modes of procedure in use for removing or destroying the glutinous substance which unites the woody core and the epidermis with the fibre, and then as to the further manipulation of converting the flax straw into fibres fit to be spun.

The preparation of flax merits all the more consideration as the complaint of the deterioration in the dressing of it becomes more general.

With the constant diminution of workmen for this process it is to be feared that the cultivation of flax may be entirely abandoned in some districts. A remedy can only be obtained in rendering the preparation possible by suitable machinery in places and districts where manual labour does not pay or is not procurable, or badly attended to.

To this question also appertain: The discussion of the different methods of steeping, the various modes of dressing, the consideration of the best tried machines, a statement of the cost of the different manipulations, and of the results of production.

The fourth question relates to the *Flax trade.*

The flax trade shows decided defects. Attention is especially drawn to the irregular sorting, which in some cases is prejudicial to the consumer. By this practice not only the spinner but also the grower of flax is injured. The Congress will have to consider whether a uniform marking of the quality for all flax growing countries is attainable and to be striven for. Furthermore, to what extent the present usages, as regards tare, nett weight, mode of making up and packing, compensation for differences in weight by the railway companies, &c. are advantageous to the flax trade or requiring alteration. The question will also be considered how far the sale could be facilitated by the establishment of flax markets, &c., especially in the districts of cultivation remote from the places of consumption.

The fifth question for the consideration of the International Flax Congress is—

> "*What are in general the ways and means of promoting the growth of flax, and the better realisation of it?*"

The means desirable for the growth and sale of the flax having already been discussed, it can be in this respect only a question of denoting the factors who appear qualified for promoting the cultivation and the better realisation of the flax products. To what extent the State, more especially, should beneficially interfere as such, as well as corporations, and the parties interested themselves, and by what means, is therefore the subject matter of this question. Moreover, the means adopted by the various governments and corporations are to be debated upon at the Congress, the results attained compared and disseminated wherever the promotion of the growth of flax appears possible and feasible. In so doing it will be seen what has been attained on the part of the factors above-mentioned by establishing schools, supporting associations, distribution of prizes, arranging exhibitions, granting concessions in regard to freight and customs tariffs, and in respect of insurance, and what would still have to be accomplished in these directions.

The International Congress of persons interested in the flax trade was convened by the General Direction of the Vienna Universal Exhibition, 1873, for the purpose of discussing these questions so highly important to agriculture, industry, and commerce.

The preliminary preparations for the Congress were entrusted by the General-Direction to a committee of competent gentlemen, and Mr. Carl Oberleithner, manufacturer, of Schönberg (Moravia), was appointed chairman. The reporters selected for the various questions are the following:—*For Question I.:* The Imperial and Royal District-Commander Mr. J. Peter, of Vienna. *For Question II.:* Professor August Leydheker, of Tetschen-Liebwerde. *For Question III.:* The Royal Commission Councillor, Mr. J. Kaselowsky, of Bielefeld. *For Question IV.:* Mr. Heinrich Morel, Secretary of the "Société de la Lys," of Ghent. *For Question V.:* Mr. Carl Oberleithner, of Moravian Schönberg.

The Congress will be held on the 19th, 20th, and 21st August 1873 in the Jury Pavilion of the Universal Exhibition at Vienna.

Notices of attending the Congress are to be sent to the General-Direction by the 10th August of the current year, at the latest, where the admission tickets will be issued to the applicants. Letters, treatises, and motions relating to the questions of the programme are also to be addressed to the General-Direction for the Universal Exhibition at Vienna, 42, Praterstrasse, endorsed, "For the Congress of persons "interested in the Flax Trade."

42, Praterstrasse, Vienna, July 1873.

(Signatures) ARCHDUKE RAINER,
President of the Imperial Commission.
BARON VON SCHWARZ-SENBORN,
Director-General.

APPENDIX C.

[TRANSLATION.]

VIENNA UNIVERSAL EXHIBITION, 1873.

INTERNATIONAL CONGRESS OF THE PRODUCERS AND CONSUMERS OF FLAX.

Vienna, 18th to the 21st August 1873.

In accordance with the terms of the official programmes Nos. 62 and 100 the reporters appointed for the different questions to be discussed propose—

That the Congress be pleased to declare and to resolve—

As to Question I.:—

What knowledge and experience have already been gained in regard to the selection of linseed, and its production for sowing seed; and by what means can the same be improved?

1. From experiments made with a variety of assorted seeds it appears: That above all other kinds the cultivation of the blue blossom common flax (Linum usitatissimum vulgare) is the best for the production of sowing seed. In the selection of seed experience shows that varying this is advantageous.

In order effectually to obviate the malpractices prevailing in the intermediate trade with sowing seed it is advisable to establish on a large scale import and seed supply associations.

2. Linseed fit for sowing purposes might and should be much more generally cultivated than is the case at present.

3. For obtaining good sowing seed as well as good fibre the Dutch, and especially the Kortryk, or another similar method of harvesting (Kapellung) is recommended as the most advantageous. None but perfectly cleaned seed should be brought into the markets.

4. For the improvement of flax and linseed cultivation it is necessary:
  (*a.*) To disseminate practical knowledge and modes of manipulation among the flax-growing farmers;
  (*b.*) To promote the establishment of sowing seed markets;
  (*c.*) To promote the sale of superabundant and locally degenerated flax seed.

5. Considering that the results of experience hitherto recorded are not sufficient for settling the question as to the production of flax seed, the Congress, having regard to the extraordinary importance of the subject, recommends a continued and thorough study thereof in the various flax-growing countries; and recommends as one of the most important functions of the permanent committee to be elected, that it devotes its full attention to this question.

As to Question II:

What systems of flax cultivation are in operation?
Which are the best? and
What means would be the most practical for propagating and extending the application of these systems?

1. Of the many varied systems of cultivation, of preparing the field, of sowing and harvesting, those prevailing in Belgium, and especially in East and West Flanders, must be qualified as the most eligible for the production of flax.

Of the several seed times (early, late, and autumn sowing) preference must in general be given to early sowing, with especial regard to the production of a strong fibre.

Sowing linseed for a second crop is not to be recommended; because it yields a fibre of inferior strength.

2. On the subject of manure, so important a matter in flax cultivation, there is this to be said: Stable dung should only be used for the crop preceding flax; artificial manures, on the contrary, such as ashes, compost, phosphates, or Chili nitre, may with great advantage be applied directly to the linseed.

Manuring the ground with unmixed lime is not to be recommended, because it produces a coarse fibre and the dust of the lime is troublesome to the labourers, especially in the process of hackling or scutching.

3. Careful cleaning of the ground and repeated weedings are to be urgently recommended.

4. Propping the plants, which is done with advantage in cultivating the *lin rame,* is only profitable with fibres of intrinsic value as such. Propping up flax that has been layed is not very practicable on large plots, and it seems to be more profitable to proceed to an early reaping.

5. It seems best instead of spreading the flax on the field, to dry it by laying it out on trestles, and to separate the seed bolls from the stalks by "rippling," instead of using other customary methods for the purpose.

6. As advisable measures for propagating more practical methods of flax culture are to be recommended—

Awarding prizes for successful cultivation of flax, and especially of good sowing seed;
Laying down model fields;
Comparative experiments in cultivating and manuring, and verbal and printed publication of the results.

As to Question III.:—

What systems of preparing flax have proved successful, and ought therefore to be recommended?

1. Among the systems hitherto adopted those only have proved practically successful, by which the straw is subjected to a process of fermentation (by steeping or retting), before the separation of the spinning fibre from the woody substance is effected by breaking and scutching.

2. Of the processes in use for steeping or retting flax, water steeping as it is practised in the neighbourhood of Courtrey on the Lys, yields the best results. The same process can be imitated without great difficulty in other localities, and is to be urgently recommended. The permanent committee will be charged to consider and determine the modifications required in particular countries.

3. It is advisable to erect good steeping establishments at the cost of communities or corporations, in order that the small producers of flax may have a share in the benefits of them, for an adequate payment.

4. Hand labour in breaking and scutching the flax will have to be supplied by machinery.

The Congress testifies that machinery can be applied with advantage, and is to be recommended even for the production of the finest and best quality of flax.

5. Public scutching mills, such as exist in Ireland in great numbers, will materially assist and increase the production of flax. These can be established and maintained at far less expenses than factories for dressing flax, and their general extension must be regarded as a step in advance, and promoted as much as possible.

6. The introduction of the Belgian method of preparing the flax is advisable for hand labour; this can be supplemented by the establishment of breaking and scutching mills, or, as the case may be, by the use of scutching machines.

As to Question IV.:—

What defects exist in the flax trade at present? and
By what means can these defects be remedied?

The Congress resolves to leave to the permanent Committee the inquiry into the defects of the flax trade, and also as regards the measures to be adopted for their removal; but records its thanks to Mr. Morel for the thorough preliminary inquiry and the suggestions he has made towards answering this question.

As to Question V.:—

What are in general the ways and means for improving and increasing the cultivation of flax, and for promoting a better realisation of the flax products?

1. The improvement of flax cultivation has been attempted in many ways, and often with great sacrifices, by governments, associations, and private persons, but in many instances without satisfying reasonable expectations as regards the result.

The Congress testifies that the explanation of these facts is to be found, partly in a misconception of the nature of the means employed, and partly in a faulty application of principles sound in themselves.

2. The most effectual way to support the measures of the governments and the efforts of societies and individuals appears to the Congress to be: To establish an international Corporation, which should consist of a managing committee, changing its locality every year, and of members in all the States interested in the cultivation of flax; and should recognise as its mission the promotion of the improvement of the flax culture and the introduction of better means of realising the market value of this article; and should fulfil that mission by obtaining the aid of science and the press in the way of instruction, by supporting practical endeavours, and, when necessary, by bringing about the enactment of special laws on the subject.

APPENDIX D.

[Translation.]

INTERNATIONAL FLAX CONGRESS.

Draft of Rules of the Proceedings for the International Flax Congress.

1. The meetings of the Congress will commence on the 19th August in the Jury Pavilion, at 10 a.m.

2. After the introductory address of the official delegate of the Director-General, the first meeting of the Congress will be opened by the

chairman of the preparatory Committee. The first business on the order of the day will be the election of president, two vice-presidents, and two secretaries.

3. The election of the members of the permanent Committee, the number of which is reserved to be fixed by the Congress, will take place at the conclusion of the last meeting.

4. The elections as well as the voting are decided by the absolute majority of the members present. The elections will take place by giving the votes in writing, provided the Congress should not decide upon another mode of voting. The votes on the propositions of the preparatory Committee, and the motions proposed during the deliberations, will take place by rising from the seats, or by calling over the names, if desired.

5. Motions and amendments by members of the Congress must be handed to the president in writing, supported if possible, by a brief statement of reasons or arguments.

6. The minutes of the proceedings which must contain the text of the resolutions in full, but of the proceedings only a summary, will be drafted by the secretaries, and signed by the President and two members appointed as verifiers.

7. The official report of the proceedings of the Congress, and the resolutions passed will be drawn up by the delegate of the Director-General in accordance with the verified minutes.

8. The official language to be used in the discussions of the Congress will be the German, but it is optional to the members to make use also of either the English, French, or Italian languages.

APPENDIX E.

List of Members of the International Flax Congress.

Vienna, August 1873.

Albert, Hermann, spinning mill proprietor, at Waldenburg, Prussian Silesia.
Andrews, Michael, secretary of the Flax Supply Association in Belfast, Ireland.
Aris, Julius, Holland.
Armistead, Alfred, wholesale merchant, member of the Imperial Russian Commission, and representative of Riga Exchange Committee.
Bäck, Brothers, of Iglau, Moravia, represented by Henry Bäck.
Bauer, Ferdinand, Pskow, Russia.
Böhm, Ferdinand, flax spinning mill proprietor, Langenau, Bohemia.
Böhm, Joseph, deputy chairman of the agricultural society, at Neustadt, Moravia, delegate.
Boye, E. C., flax factory director, Berlin.
Breuer, Joseph, Tarzanow, province of Posen.
Cantoni, Gaetano, director of the Royal High School of Agriculture at Milan.
Charus, chief inspector in Dammer.
Collyer, Dr., machine builder, North America.
Conrad, William von, representative of the Agricultural Society of Graz, Styria.
Cretius, Captain, in Hönigern.

Darowski, Chevalier de, president of the Branch Agricultural Society, Lemberg, Galicia.

Dittrich, Charles, (of the firm Hielle & Dittrich), factory proprietors at Schönlinde, in Bohemia; and Zievardowo, in Russia.

Dolenc, Richard, representative of the Agricultural Society at Laibach, Carinthia.

Drechsler, Adolphus, spinning factory director, at Heidenpiltsch, Moravia.

Dunbar McMaster, Henry, Belfast, Ireland.

Emmer, Moriz, director of the flax spinning mill of Ignaz, Seidl & Co., in Zautke, near Moravian Schönberg.

Epner, C., senior, Berlin.

Ettrich, Ignaz, factory proprietor at Oberaltstadt, near Trautenau, Bohemia.

Fedra, Leopold, archducal factory director in Teschen, Austrian Silesia.

Fischer, Albert, in Coeslin.

Flandorffer, Charles, factory director at Hannsdorf (Moravia).

Flatow, E. of Mülhausen (Eastern Prussia).

Count Fries, August, at Vöslau, delegate of the Imperial and Royal Moravian and Silesian Agricultural Society at Brünn.

Baron de Geusau, Charles, imperial and royal major, landed proprietor, and president of the Flax Cultivation Committee in the district Upper Manhartsberg at Engelstein.

Grothe, Dr. H., engineer in Berlin, member of the German Linen Industry Association, and delegate of several spinning and weaving mills.

Grove, chief magistrate at Netsche.

Grutsch, Francis X., chairman of the Agricultural Society at Mödling, Lower Austria.

Hampe, Dr. J. U., Prince Liechtenstein's attorney at Vienna.

Helle, Charles, of Pressburg, delegate for Hungary.

Hennebert, A., conseiller provincial, at Colles-Hainaut, Belgium.

Hensch, Arpad, of Käsmark, Hungary.

Hirt, Robert, manufacturer of Freiberg, Saxony.

Hobeck, Thomas, director of the agricultural and flax-dressing school, at Moravian Schönberg.

Hoffers, Alexander, of Berlin, secretary general of the German Flax Cultivation Society.

Hofmann, S. W., economic councillor of Vienna, delegate of the Imperial Royal Agricultural Society at Vienna.

Baron von Hohenbruck, Arthur, imperial and royal ministerial councillor at Vienna.

Hoyer, professor in Riga, Russia.

Hoz, Julius, spinning master at Ullersdorf, county of Glatz.

Hromatka, S., secretary of the Agricultural Society at Neustadtl, Moravia.

Hruska, & Son, Patrick and Ferdinand, at Solnic, in Bohemia.

Von Hudec Wenzel, of Brodky in Galicia, delegate of the Galician Agricultural Society at Lemberg.

Hulders, E., retting master of Carinthia.

Janig, William, aulic councillor to Prince Rohan of Sichrow (Bohemia).

Jerie, W., factory proprietor in Hohenelbe, Bohemia.

Jilien, Nicholas, professor at the Technological Institute, in St. Petersburgh, Russia.

Kaselowsky, S., royal commission councillor of Bielefeld, president of the German-Austrian Flax Industry Association.

Keurenaer, J. A., of Waltenburg-Fauquemont, near Mastricht, Holland.

Baron von Killisch, Dr., of Berlin.

Klüge, Francis, spinning mill proprietor of Trautenau, Bohemia.
Kluge, G. A., spinning mill proprietor of Trautenau, Bohemia.
Kossuth, Stephen, technologist, Russland.
Kotnik, Charles, landed proprietor, of Upper Laibach, Carniola.
Kriegsmann, George, landed proprietor of Ranzau, near Wolmar, delegate of Livonia.
Baron von Kruedener, C., Russia.
Langie, delegate of the Agricultural Society at Cracow, Galicia.
Leeder, Henry C., manager of the Flax Association of the Giant Mountains.
Leopold, chief magistrate of Hirschberg.
Leydheker, Augustus, professor of agriculture, of Tetschen-Liebwerde, Bohemia.
Liedtke, Alexander, manager of the firm Surminski and Hoppe, of Königsberg, Prussia.
Liedtke, S. W., of Königsberg, Prussia.
Loesch, J., landed proprietor of Larzendorf.
Lovis, Charles, professor at the Polythectnic, in Riga.
Chevalier von Markhof-Mauthner, Dr., of Troppau, Austrian Silesia.
Methner, councillor to the Board of Trade, linen manufacturer at Landshut, Prussian Silesia.
Metzald, L., of Berlin.
Migerka, Dr., of Vienna, imperial and royal ministerial councillor, official delegate of the general direction.
Misch, Emil, merchant in Lemberg.
Möller, Dr. R., Brackwede, near Bielefeld.
Moll, C. E., flax merchant, in Rotterdam, Holland.
Morel, Henry, member to the Commission at Ghent, Belgium.
Müller, Augustus, negociant at Antwerp, Belgium.
Müller, Henry, of the flax mill, Hirschfeld, at Zittau, Saxony.
Neumann, Henry, of Neustadtl in Moravia.
Nostiz, Rienek Louis, count of the empire, at Berlin.
Oberleithner, Charles, president of the Agricultural Society of Schönberg, Moravia.
Oberleithner, Edward, factory proprietor in Schönberg, Moravia.
Obratschai, archducal steward at Friedeck, Moravia.
Von Pannewitz, magistrate's counsel at Paulsdorf, and delegate for Upper Silesia.
Papius, landed proprietor of Grzeda, near Lemberg, Galicia.
Peter, Joseph, imperial and royal district captain, in Vienna.
Plank von Plankenburg, A., landed proprietor at Neuhaus, on the Danube, Upper Austria.
Von Pretis, Antonio, imperial and royal ministerial secretary, Vienna.
Rayman, Adolphus, factory proprietor in Freiwaldau, Austrian Silesia.
Prince Repnine, of Jagotine (Russia).
Roncourt, A., representative of the "Presse," in Vienna.
Rufin, Alfred, of Simmenau.
Russ, John, spinning mill director in Upper Altstadt, Bohemia, President of the Flax Association of the Giant Mountains.
Scheibler, Charles, linen factory proprietor, at Lodz in Russia.
Schiller, Hanns, Prince Liechtenstein's steward at Heinzendorf, near Iglau, Moravia.
Schindler, Francis, director of the spinning factory in Krumau, Bohemia.
Schlösser, Henry, spinning mill proprietor in Osorkow, Russia.
Schollmayer, Francis, Member of the Managing Committee of the Agricultural Society of Laibach, Carniola.
Schütz, Cosmas, secretary and delegate of the Imperial and Royal Carinthian Agricultural Society at Klagenfurt.

Schwarz, D., merchant in Vienna.
Schwarz, E., spinning and weaving mill proprietor in Gutstadt, Eastern Prussia.
Schwarz, F., farmer, manufacturer, and proprietor of a flax dressing establishment at Kleedorf, near Schrems in Lower Austria.
Schwarz, Jacob, wholesale flax dealer at Gutstadt, Eastern Prussia.
Schwestka, William, in Moravian Neustadt.
Siegl, Richard, of the firm Carl Siegl, senr., in Moravian Schönberg.
Sison, Robert, Royal Domain director at Pirna on the Elbe, Saxony.
Sonntag, C., director-general of the German Flax Cultivation Society, at Berlin.
Spiller, E., in Namslau, Prussian Silesia.
Spravka, Dr. J., director in Teschen, Austrian Silesia.
Stebutt, John, Professor of Agriculture at Moscow, Russia.
Steinbrecher, Leopold, spinning mill proprietor at Krumau, Bohemia.
Struszievic, director of the Agricultural College at Dublany in Galicia.
Trientl, Adolphus, chaplain in Hall, Tyrol.
Ullmann Brothers, flax merchants at Iglau, represented by Henry and Alois Ullmann.
Walzel, Clements, spinning mill proprietor in Parschnitz, Bohemia.
Warneck, F. W, machine manufacturer at Oels, Prussian-Silesia.
Weinmann, Dr., Fr. L., from London, reporter of the Royal British Commission for the Vienna Universal Exhibition.
Weiss, Adolphus, twine factory proprietor at Friedland in Moravia.
Weiss, Francis, twine factory director at Friedland, Moravia.
Wessely, J., Prince Schwarzenberg's mining director at Schwarzbach, near Oberplan, Bohemia.
Wolff, Baron von J., Druween, near Riga, Russia.
Wynecken, Royal Domain farmer at Bodzanowitz.
Zadig, B. A., wholesale flax merchant at Breslau.
Zadny, A., managing director to Count Nostiz at Prague.
Zenker, chief inspector at Mangschütz.

APPENDIX F.

VIENNA UNIVERSAL EXHIBITION, 1873.

INTERNATIONAL FLAX CONGRESS.

THE CULTIVATION OF FLAX AND HEMP IN AUSTRIA, WITH STATISTICAL TABLES.

The information contained in the following pages on the cultivation of flax and hemp in Austria was collected for the Universal Exhibition by the Imperial and Royal Ministry of Agriculture at Vienna from a variety of sources, chiefly the agricultural societies in the different parts of the monarchy; and is here reproduced in English, in a condensed form, from the German original, edited by Arthur Baron von Hohenbruck, Imperial Councillor in the Ministry of Agriculture, and submitted to the members of the International Flax Congress.

The growth of flax and hemp is of particular importance in the western half of the Austro-Hungarian monarchy, the value of the annual yield in these spinning materials and in seed amounting as per detailed statement in the annexed tables to 38·2 millions of florins.

With the exception of the Karst domains, flax is cultivated to a considerable extent in almost all Crown lands, especially in Bohemia, Gallicia, Moravia, Styria, Carinthia, Lower Austria, &c. On the other hand, hemp is only grown in a few Crown lands, more particularly in Eastern Gallicia, in the Bukowina, in Western Gallicia, Moravia, Carniola, Styria, &c.; it, however, appears mostly in conjunction with flax culture.

The total area, which is devoted to the cultivation of flax and hemp (apart from the cultivation of hemp in the Bukowina, as an intermediary crop in fields sown with grain or Indian corn, which prevails to a considerable extent) amounts together to 266, 556·56 joch (=153,394 hectares), of which 198, 464·57 joch (=114,209 hectares) are devoted to the cultivation of flax, and 68, 091·99 joch (=39, 185 hectares) to that of hemp.

The average yield in spinning fibre in a retted condition, and in seed per joch or hectare varies extraordinarily in the several Crown lands; this is to be attributed partly to the different attention bestowed on these branches in the various localities, and partly to the circumstance that in some districts more importance is attached than in others to the production of material for spinning than of seed. Moreover, in many districts flax is sown as a second crop, and in that case no care is taken of obtaining seed, in consequence of which the figures showing the yield are materially altered.

Entering now upon the subject of the conditions of cultivation in the several Crown lands, we will commence with a short description of the culture of flax and hemp in Lower Austria.

Whilst hemp is gown here and there in the low lands of the country, where a deep alluvial stratum saturated with suitable manure prevails near the streams and rivers, the growth of the flax plant is more confined to the hills, on order to compensate its cultivators, mostly small landed proprietors only, by plentiful crops for the unfavourable position for cultivating grain. The cultivation of flax is most extensive, and has in part, at least, the appearance of being a commodity for commerce, in the district of Upper Mannhartsberg where, in consequence of the influence of the Vienna Agricultural Society, and the local flax cultivating committee for that district, supported since 1868 by the Ministry for Agriculture, a greater activity in promoting the growth of this article which is not without its importance for that district, has manifested itself. The results obtained in this direction and abundantly illustrated at the exhibitions of flax which have now been held for the third time in this district at different places, are especially to be attributed to the continued importation of genuine Russian flax seed (from Pernau and Riga), by the Agricultural Society, owing to which circumstance the degenerated native seed was gradually replaced. In like manner exertions were made by the district captain, Josef Peter, who has been despatched annually for several years during the whole summer to the flax growing districts, to introduce the Belgian improved system of cold-water retting in place of the dew and turf rettings which, unfortunately, are still the prevailing methods in the country. This improved cold-water retting, according to the Belgian method, has been already adopted in the districts of Weitra, Schrems, Litschau, as well as in that of Neunkirchen. Successful efforts are also being made to discontinue the old practice of parching the flax-straw at a high degree of heat prior to the process of breaking, and to introduce suitable implements for dressing the flax.*

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* In some districts, for instance in Grossgerungs, Weitra, &c. the so-called "hair-roller," a breaking instrument, similar to the washing-mangle, is at present in use for breaking the flax-straw, which does not work badly. Otherwise the one-clefted break is used.

But the greatest importance for promoting the cultivation of flax in Lower Austria most be attached to the erection of their own establishments for retting and dressing flax by machinery, two of which are already in existence; one on the estate of Prince Liechtenstein at Seebenstein, near Neunkirchen, and the other an establishment for dressing flax, arranged entirely according to the Belgian system at Kleedorf, in the district of Schrems. This latter is materially supported by means of well arranged establishments for cold-water retting at Rossbruck, near Weitra, and at Purbach, near Schrems. These establishments, by producing a better article, will probably soon be in a position to command favourable conditions of sale, and consequently higher prices.

In Upper Austria the cultivation of flax is carried on in almost all parts of the country for the purpose of supplying at least domestic requirements, and the conditions of culture are similar to those of Lower Austria.

The cultivation of flax more especially prevails in the district of Mühl and in that of the Inn (in the former, particularly in the districts of Freistadt, Rohrbach, Leonfelden, and Neufelden; in the latter, in the districts of Ried [over 500 joch], Scherding, Haag, Reuerbach, Raab, and Obernberg). In the district of Hausruck the most important cultivation of flax is in the districts of Grieskirchin, Wels, Efferding, Gurunden, &c. On the other hand, the area of flax cultivation in the whole of the Traun district scarcely compares with that of the Ried district, and is only of some importance in the districts of Steyr and Grünburg.

With the exception of the Mühl district where it is only cultivated in some localities, and amongst them in that of Perg especially, hemp is everywhere to be met with, but only to a small extent. It is confined solely to small plots on which hemp is grown by some peasants partly for the sake of the seed, and partly also to obtain the fibre for coarser sorts of textures.

The treatment of flax in Upper Austria still leaves much to be desired, this unfortunately is the case also with respect to its cultivation in the field, the obtaining of good fibres and a greater quantity of seed being uniformly the object striven for.

The best flax in Upper Austria is grown in the Mühl district, the linen-weaving business of which, not unimportant some time back, has declined in the course of time in consequence of the changes in the mode of manufacture. More recently endeavours have been made to progress in this direction also, since the Agricultural Society of Upper Austria has effected the importation of good flax seed, and the attention of those interested in the culture of that article has been directed to the defects of their system by the reports of the district captain, Peter More.

The endeavours to build establishments for dressing flax and the introduction of the cold water rettings will probably be attended with success in Upper Austria as well.

The cultivation of flax at Salzburg is still in the most primitive condition. A correct comprehension of the locality to be used for the growth of this plant, that is to say, its rotation in a rational succession of crops is wanting as much as the proper preparation of the land itself. Frequently virgin soil is selected for it, the consequence of which is that grass and herbs grow apace, and expensive weeding becomes necessary. In the selection, too, of seed for sowing, far too little care is bestowed, and unfortunately most unsuitable and only imperfectly ripened seed of the preceding year is used. These defects will be removed to some extent at least by the importation of original flax seed from Riga and Oetzthal by the Salzburg Agricultural Society. Still in order to make further progress it is requisite that the peasants who grow flax should decide whether they wish to produce fibres only or seed.

In the parish of Thalgau, winter seed has more recently come into use. This gives an unimportant yield of spinning fibres, but plenty of seed for winter food for the cattle, and the deficit of suitable fibres is replaced by spring flax seed.

In the Salzburg district only dew-retting is practised, and no establishment whatever exists for dressing flax. The implements used there in its cultivation are: Rippling combs for rippling the seed bolls in cases where thrashing is not employed; two quadruple parted hand-breaks of beechwood, swingle stocks and handles, and the flax comb. After retting, the flax is dried over fires lighted in ditches in the open air, or in scutching rooms or in ovens.

In the opinion of the reporter, it would be desirable to direct the attention of the farmers at Salzburg to the growing of seed in the cultivation of flax.

At Salzburg hemp growing is chiefly confined to plots of land only from two to four klafters in extent, and particularly on such spots in the grain fields on which manure had been deposited the year previously. It is evident that accurate information on this point is impossible; however, several conferences with a large number of farmers have proved that, approximately, the tenth part of the area which is farmed with flax in the country is devoted to the cultivation of hemp in the manner described.

In Northern Tyrol the cultivation of flax is general in the valleys, and even extends to a height of 4,800 feet above the level of the sea. It, however, appears to thrive best at between 2,000 and 4,000 feet. The growth of flax is to be met with more especially on gneiss and micaceous strata, the soil of the valley of the Oetz, which contains a great deal of potash and phosphoric acid but very little lime, furnishing an actual example of this fact. The micaceous clay slate likewise furnishes good soil for flax. At Oberleutasch it also thrives, as an exceptional case, very well on a lime soil, but flax seed from the valley of the Oetz is used there. Flax also thrives excellently in the alluvia of the Inn; on the other hand, however, the seed soon degenerates in the lime stratum.

In Northern Tyrol the yield in the cultivation of flax is for the most part only intended for domestic requirements, and these are scarcely covered. However, the valley of the Oetz, and the neighbourhood of Axams, near Innspruck, where unusually good flax seed is grown, which is disposed of in other parts of the Tyrol and also in other Crown lands of Austria, as well as the whole of the right bank of the Inn from Imst to Kematen, the Mittelgebirge near Innspruck, Hall, and the valley of the Ziller form an exception, and flax or home-spun linen is conveyed thence to market.

Owing to the profit in the growth of linseed, more than two-tenths of the entire area of land under cultivation are, in many districts, sown with flax, and the prices of the spinning materials likewise attained the considerable height of 46 to 50 florins. In consequence of the efforts of the Agricultural Society of Innspruck, which is supported by the Ministry of Agriculture, and of the itinerant instructor, Chaplain Trientl, to introduce better implements, and the erection of establishments for the dressing of flax, the cultivation of it in Northern Tyrol could probably be materially improved.

On the other hand, the cultivation of hemp in Northern Tyrol is of scarcely any importance, and this plant is mostly grown in very small quantities only, as an inclosure of fields sown with Indian corn or potatoes, and even sporadically in some corn fields. The product serves as shoemakers' yarn for domestic use, and the seed as food for birds. The cultivation of hemp possesses more importance in the localities around Ebbs in the lower valley of the Inn, and in the district of Landeck in the upper valley.

In the German portion of Southern Tyrol the cultivation of flax and hemp is only carried on to a small extent in the valleys of the Alps, extending towards the north, namely, in the valley of the Puster and the Sarn, and in the direction of Schlanders, as well as in the neighbourhood of Meran, Bozen, and Neumarkt. But the prices of the prepared fibre, considering its being so little grown, are pretty high.

In the Italian portion of Southern Tyrol flax is only grown in the district of Male, whereas hemp is grown everywhere, especially in the jurisdiction of the Agricultural Society of Rovereto, although only to a small extent.

In Vorarlberg also the cultivation of flax is carried on only for domestic requirements in quite a subordinate manner; however, the cultivation of hemp is of greater importance in the districts of Feldkirch and Dornbirn, as well as on the banks of the Rhine generally, the neighbourhood of Lústemau, being especially distinguished in that respect. Yet, compared with the importance of the rearing of horned cattle and of dairy-farming in general, the cultivation of flax and hemp, as well as the prices of these products, have very much decreased of late years.

With regard to their cultivation in Styria, very copious data are to hand. According to these, the cultivation of flax provides the small landowners in some districts with a valuable source of income. This is especially the case in the southern declivities of the chain of Alps, and more particularly in the districts of Friedberg, Vorau, Pöllau, and in some communes of the districts of Hartberg and Birkfeld, as well as in those of Voitsberg, Stainz, Deutsch-Landsberg, and Eibiswald. Besides this, flax-cultivation is carried on in the highlands of Passail and Semriach, on the Bachergebirge, near Windischgraz, Gonobitz, and Windisch-Feistritz, and quite in the south of Styria, in the districts of Drachenburg, Lichtenwald and Tüffer. In the district of Vorau alone about 400 joch are sown with flax, and the labourers employed there for its cultivation may be estimated at 4,500 persons. The growing of flax in Styria not only gives employment for domestic weaving to the peasantry, but also to about 800 linen-weavers besides, who ply it as their trade; and it may be assumed that the 112,280 growers of flax, that is to say, five-sevenths, of all the land owners of Styria, produce annually, about 80,000 cwt., of which about 55,000 cwt. is spinning material, producing about 11,000,000 yards of linen.

Unfortunately, proper attention is not always paid in Styria to the cultivation of flax, especially as regards the selection of suitable plots of land and the treatment of the plant, as well as in respect of the cultivation of the flax-seed and the change of crops. The sowing of spring flax-seed, which was formerly more customary, has decreased of late, notwithstanding the better yield in quality of spinning material and of seed, and this because the proper harvesting-time is not observed, and losses result therefrom. Dew-retting is still in general use in Styria, and the flax is then dried in drying-rooms about the middle of August, and afterwards scutched. It is only in the centre part of the country that the late flax is not rippled before the ensuing spring; it is then dew-retted, dried, and scutched with the spring flax. In some districts a sum of 32 kreuzers per pound is obtained for scutched flax.

In Styria the conditions of climate and soil are more unfavourable to the cultivation of hemp than to that of flax. It is, however, met with throughout the country, and its cultivation, notwithstanding the inferior return, may be attributed to the preference of the house-wives for the twine they have obtained themselves. An oil is made from the seed, which is generally used as medicine in cattle diseases; the remainder is disposed of as food for birds at the price of 4 florins per peck. Notwithstanding the bad quality, the pound of hemp reaches here and there the price of 20 to 30 kreuzers, at the time of paying taxes.

Hemp thrives more especially along the frontier of Croatia, and it is to be remarked that it is planted there to a great extent along the roads as a quickset hedge, in order to prevent the animals passing along from going into the fields.

Hemp is only grown for commerce in the neighbourhood of Mureck, Radkersburg, &c. Compared with the prices of Italian hemp at 28–33 florins per cwt. and of Hungarian at 27–31 florins, that of Styrian growth at 22–28 florins is always worthy of note.

Usually, no care is bestowed upon the cultivation of hemp in Styria, the less as mostly only from 20 to 50 square klafters are devoted to it by the various proprietors. It is generally grown continuously on the same spot with annual manuring. In other cases fields are preferred on which Indian corn or herbs were grown in the previous year. Generally only native hemp seed is sown. It is only in the vicinity of the Sottla stream that Hungarian seed is also used as a change by some proprietors, as well as Italian; this moreover, with particular success. Nevertheless, far too little attention is paid to the rearing of seed, and more especially to the earthing-up of the seed stems.

The dew-retting of the hemp usually takes place at the end of September or in October, and even in November. Water-retting is only in use here and there, and more especially with hemp of strong stems. A beginning has already been made to use flowing water for this purpose.

In those cases in which hemp growing is only carried on for the sake of obtaining spinning material, late flax is still often sown on the same field, which remains entirely free from weeds.

Amongst the implements for dressing hemp peculiar to the country may be mentioned the so-called "tread-swingle" (trettklippel), consisting of two pieces of wood, which are placed longitudinally like the teeth of a saw, and are set in motion with the feet.

In Carinthia the cultivation of flax and hemp has been carried on from time immemorial, and flax in particular was grown to a much greater extent formerly, than is the case at the present time.

This retrogression must in great measure be attributed to the circumstance that markets are wanting for the disposal of the finished goods.

Formerly Carinthia supplied the small hand-spinning factories in Carniola with cheap raw material, and the flax trade was entirely in the hands of hawkers from that country and the Tyrol, in consequence of which the price became depressed and the growing of flax less remunerative; but, except to the conditions of the labouring classes always becoming more critical, the decline in the growth of flax in Carinthia may be also attributed to the fact that the old-fashioned primitive mode of dressing the flax was retained, that people would only use dew-rettings, and objected to discontinuing the parching of the flax, and the use of the hand-brake. This is all the more to be regretted because Carinthia can boast of conditions unusually favourable to the cultivation of the plant, so that this country could even enter into competition with Belgium as regards the quality of the raw product.

The valley of the Lavant, the district of Feldkirchen, and the entire valley of the Drau in particular are favoured with a deep-clay and clayey-sand soil. In summer the climate is warm and damp, cultivation does not suffer from storms, the crops being everywhere protected by the conformation of the hills. As the country is situated in the region of the summer rains, the heat is tempered by frequent dews. These circumstances and autumns of long duration, allow flax to be sown in corn stubbles, and to be harvested as second crop, of course foregoing the seed in this case.

The numerous lakes and their outlets are particularly to be mentioned. In the summer months and till after the commencement of September, they attain a temperature of from 18 to 24 degrees, Réaumur. The water never becomes turbid, so that water-retting could be introduced to a great extent in Carinthia, and by so doing a product supplied which would worthily take its place by the side of the Courtrai flax, and that obtained in the Lys in Belgium.

Special attention has recently been directed to the cultivation of flax by the Agricultural Society at Klagenfürt, and by aid of a grant from the Ministry of Agriculture, that society has been enabled to engage a flax-retting master from Belgium, for the purpose of introducing cold water retting throughout the country, and to initiate a better mode of dressing.

In addition to this the society has facilitated the importation of original Riga and also of Zealand flax seed, in consequence of which the demand for sowing seed is constantly increasing. The farmers in the valleys of the Lavant and the Drau have been already made familiar with the cold-water retting by the retting-masters, who have now been at work there for four years. They have, in like manner, been instructed in swingling the flax, and suitable breaking machines have been introduced. Besides the erection of small buildings for the breaking and swingling of flax, the establishment of three flax markets at Spital, Feldkirchen, and Wolfsberg, will be a means to further support this branch of agriculture.

Whilst the cultivation of flax is domesticated in Upper Carinthia, hemp is grown in Middle and Lower Carinthia only in some places on a large scale. In the valley of the Lavant it is the neighbourhood of St. Andrä, and in Middle Carinthia that around Klagenfurt, especially towards the south, where hemp culture is chiefly represented. In addition hemp is grown in the Rose valley, district of Villach, and in the Gail valley.

The flax-retting master also devotes his attention to the dressing of the hemp, and trials with cold water retting have already been made successfully. The hemp grown in Carinthia is not an article of export, but is worked up in the country itself by the numerous ropemakers there.

In regard to Carniola, we gather from a small paper published by Franz Schollmayr in the "Naznanila" of the Carniolan Agricultural Society, with a small map illustrative of the flax culture, that the cultivation of the same is, with few exceptions, carried on throughout the country. In some districts of Upper Carniola the flax area even amounts to from six to seven per cent. of the arable area, whereas the conditions of soil and climate of the district of Karst or Central Carniola are less favourable to the cultivation of the plant.

In general it may be assumed that, on the whole, more winter flax (which is sown between the middle of August and the middle of September in old manured and prepared fields, and in some districts, as, for instance, in the Wochein, also with the winter seed in the same winter field) is sown than summer flax, and moreover, in Lower Carniola it is also sown here and there with buckwheat, which is intended to furnish the second crop. In some places, too, flax is sown as second crop after manuring during the winter season. The winter flax generally sown in Carniola is a variety of the *Linum usitatissimum*, which only differs from the Carniolan spring flax in a strong root and anastomosis, producing a short coarse fibre.

The Carniolan Agricultural Society has recently facilitated the importation of original Riga flax seed, and the demand for it is very considerable in consequence of the excellent results attained by it.

With regard to the treatment of the flax, it is to be observed as a difference from other localities, that before gathering the seed complete drying is first accomplished by stooking and only then it is rippled. In general, dew-retting is used (water-retting only with few exceptions), and the flax is still dried on the old primitive drying ovens. The breaking is effected by means of single and double hand-brakes; however, some new breaking machines have been already introduced in the country. A flax market of some importance is held every year at Laibach. It may be accepted as a reason of the extent of the cultivation of flax in Carniola, which is not otherwise very profitable, that the women make all their outer and under clothing of linen. Formerly Carniolan linen and yarn had also a commercial importance, and was disposed of to Italy, more especially that from Bischoflak and Krainburg. The linseed oil obtained is used for burning, not so much in the preparation of food.

Hemp is chiefly grown in Lower, and only to a small extent in Upper, Carniola (the territory of the lime Alps) and Central Carniola. In the lime Alps district the arable area is in proportion to the area of hemp cultivation as 165 to 1; in the foreland of the lime Alps as 163·6 to 1, and in the inland slopes as 86·3 to 1. Hemp is either sown alone or sprinkled in as intermediate crop with potatoes or barley. The former is more especially the case in the entire marshland of Laibach, where, however, hemp seed is seldom harvested, mostly hemp bast. Generally, only native hemp seed is used for sowing, which gives a yield of 2·5—13 bushels of seed. and four to five cwt. of hemp per joch. Dew-retting and drying on ovens are in general use, the hemp being, in consequence, of an inferior quality, and less by two-thirds in value than the imported Italian hemp.

Breaking is only done with the single or double hemp-breaker; the hemp is also scutched by hand. The hemp is generally used for coarse sackcloth, and twine for domestic use, whereas the seed is used for making oil for domestic requirements. Only small quantities are sent to Italy, *viâ* Trieste, as food for birds.

The hemp production of Carniola is opposed by a considerable import of foreign hemp, about 400 cwt. annually from Italy (in three qualities, Bolognese, Centeser, and Ferrarese, each of these again sorted in four qualities), 100 cwt. of Hungarian, and 100 cwt. of Carinthian hemp being imported into Carniola every year for rope-making, the value of which may be estimated at not less than 25,000 florins.

In the country near the coast, flax is only cultivated to a great extent in the district of Görz, that is to say, in the district of Flitsch in the foreland of the Alps, in that of Tolmein in the upper valley of the Isonzo, and in the district of Kirchheim in the valleys of the Idria and the Bazha. Summer flax is for the most part grown there and only little winter flax. The former (known by the name of "jar") is, as a rule, sown in deep-lying land about the middle of March, and in higher situated soil at the commencement of April. Flax is only sown with buckwheat or carrots as second crop, in exceptional cases.

Dew-retting only, and drying in open ovens (tusilna jama) are exclusively used in the Görz district. Double hand-brakes (terlika) are used for breaking, and a pound of clean-braked flax fetches from 20 to 30 kreuzers. The flax is spun during the winter months in the houses of the peasantry both by men and women, and yarn chiefly spun of it for medium fine linen, and hodnik, as a coarse fabric for sacks, trousers, &c., which are printed in large blue-printing establishments, in the district itself.

In the hilly district of Canole and in the communes scattered about the State forest of Ternowan, both hemp and flax are grown on small plots to cover domestic requirements, whereas, in the lower valley of the Isonzo both flax and hemp cultivation has almost entirely disapappeared, and it is only in the neighbourhood of Monfalcone that hemp is grown by some proprietors, as also in the commune of Mouhigna in the Karst Mountains.

In Istria, hemp is only grown by small landed proprietors in some districts, as for instance, in two communes of the district of Castelnuovo, on land belonging to the house, to the extent of 20 to 30 square klafters, and only for domestic requirements. The cultivation of flax on the other hand, is only met with in all Istria in the district of Montana, and even there, but to an inconsiderable extent.

In Dalmatia, the cultivation of flax and hemp appears only sporadically, flax being grown only in the districts of Arbe, Zara, Lesina, Macarsca, Met-Rovic, and Cattaro, as well as on the Island of Brazza. On the other hand, the cultivatlon of hemp is favoured in the territory of the mouth of the Narenta, water-retting in small pits or pools (called "Jarunke") being customary in that part of the province. The breaking is done by hand or with a coarse wooden blade, sometimes also with a primitive wooden brake-machine with double grooves and tongues. Experiments to grow the gigantic hemp of Piedmont, which the Government at Zara had made during the last three years, by the itinerant agricultural instructors Lovric and Diana, in the districts of Almissa and Macarsca, produced very good results.

With regard to the cultivation of flax, Bohemia with an area of arable land amounting to 62,000 joch devoted to this branch of agriculture, undoubtedly ranks first in all Cis-Leitha. The cultivation of hemp, on the other hand, on only 250 joch, appears of less importance, as it is only to be met with sporadically on land adjacent to the houses.

The special importance of the cultivation of flax in Bohemia, which alone yields an annual profit of about 10 million florins in value, also justifies a more minute description of the respective conditions, and it is only to be regretted that the inquiries already instituted for a long time past by the Parliamentary Committee for Bohemia, and by the former Patriotic Economical Society at Prague relative to the state of flax-cultivation in Bohemia are not terminated.

In the harvest statistics of Bohemia of the year 1868, the average yield was calculated at 4·33 cwt. scutched flax per joch. According to an estimate of Professor A. Leydheker, however, 6 per cent. of the entire area of flax-cultivation produced an average yield of 9·59 cwt. of scutched flax, or treble the quantity of the mean yield throughout the country.

In North-western Bohemia flax is at present grown in the district of Eger only from old habit, so to speak. The servants are paid with this article, and the peasant is besides anxious to give employment to his people during the winter. It is more especially the female portion of the population which continues the cultivation of flax.

In the district of Saaz, on the other hand, the growing of flax was successfully tried at Brüx in the year 1864, as well as at Niedergeorgenthal, Biliu, Görkau, and Puchority. However, the cultivation of the hop-plant renders competition with flax so difficult in that district. The flax districts proper are the hilly tracts of the country, the neighbourhood of Peterswalde, as far as Joachirnsthal in the Erzgebirge, the neighbourhood of Karlsbad, as far as Marienbad, and in part also the Ascher domain. Here the culture of this commercial plant can undoubtedly assume larger dimensions than is the case at present, owing to the insufficient protection of the fields, and the defective preparation of the fibre.

But up to this date there are no establishments yet for retting flax here. Instead of water-retting dew-retting is still practised, notwithstanding that Count Albert Nostiz, in the year 1853, already suggested in the most active manner the construction of such undertakings according to the Irish-Belgian system. At the same time Herr Hecht of Katzengrün recommended the erection of a flax-retting establishment at Karlsbad, as the centre of flax cultivation, for which end the warm temperature of the spring was to be made available by conduit pipes.

While the cultivation of flax was making gratifying progress in recent times in the hilly districts of Pressnitz, Katharinaberg, Sebastiansberg, and Dux an endeavour was made to erect a flax-dressing establishment at Pressnitz by a company of shareholders. At present none exists, as the one at Pressnitz with water retting (Fuchs' patent sweat-retting and Friedländer's patent swingling machine) failed, and those in course of construction at Kaoden and Görkau were discontinued.

Thus it happens that the flax is sold partly in stems to flax-dressing establishments in Saxony; that the machine is still little used in preparing the fibre of the plant, and that even hand spinning here and there manifests its precarious existence. It must indeed be regarded as a step in advance if in the breaking houses of the communes the plant is partly converted into flax by hand and partly by machinery, which is then purchased by dealers and conveyed to Trautenau, or into foreign countries.

The most important places of flax culture in North-western Bohemia are the villages of the Teplitz circuit, and those of the districts of Pfraumberg, Pachau, Falkenau and Graslitz.

No market-halls for flax exist in this neighbourhood.

Large quantities of flax are grown in the eastern portion of Bohemia; but the conditions of climate are less favourable there, as in southern and south-western Bohemia, and the quality, consequently, is not so good; There are not any special flax markets in this neighbourhood, and purchase is effected by brokers. The flax-retting establishment at Wodin, in the district of Pilgram, was not successful.

Growers invariably use dew-retting and prepare their flax in the peculiar old-fashioned drying houses belonging to each commune, the arrangements of which have been continued unaltered from time immemorial.

The most important districts of flax-cultivation there are the districts of Hohemnauth, Hlinsko, Leitomischl, Policka, and some places in the district of Skuc.

In northern Bohemia the retting and breaking of flax is not done in buildings specially constructed for this purpose.

In this neighbourhood there are nine undertakings for growing flax, viz., at Wiesenthal, Ober-Rolbendorf, Bober, Mittel-Altenbuch, Ober-Altstadt, Polsdorf II.; and at Liebenau there are three undertakings of the kind.

At Trautenau there is a yarn exchange, at which also flax is sold.

The cultivation of flax is of greatest importance in the Bohemian Forest in the southern part of Bohemia, where it is especially grown in the districts of Hohenfurt, Oberplan, Prachatiz, Winterberg, and also at Bergreichenstein in the district of Budweis and Pisek; and in fact it will hardly be possible to point out in Europe another tract of country planted with linseed equally large in proportion with the total area of arable land.

According to the detailed reports of Josef Peter,* the cultivation of flax in the Bohemian Forest, where the conditions of soil and climate are particularly favourable to it, is chiefly in the hands of small farmers, who are able to devote the greatest care to their flax fields, and only use about one-third of their crop for their own requirements, while they dispose of the rest to flax-spinning factories.

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* *See* the Report on the State of Flax Cultivation in the Bohemian Forest, with Suggestions for Promoting this Branch of Industry in that part; by Josef Peter, Imperial and Royal District Captain (retired). Separate edition, reprinted from the 7th section of the reports of the Imperial and Royal Ministry of Agriculture at Vienna of 1872.

It would be particularly desirable that more attention were paid to the culture of fine flax, so that the native flax-spinning factories be enabled to meet also in this respect the competition of England and Belgium in fine goods. It is to be regretted that in the Bohemian Forest flax is too frequently grown in the same field, as in the most fertile flax districts each field yields flax on the average every fourth or fifth year, and frequently even triennially. Neither is proper care devoted to manuring in the Bohemian Forest, with the exception of the so-called flax-chamber of Oberplan. On the other hand, the change of seed is the favourable point; for, similarly as in Flanders, the farmer here sows every year, foreign seed, mostly from Pernau, the Tyrol, and Riga, and rarely uses his own seed. Proper care, however, is unfortunately not as yet devoted to the dressing of the plant, since dew-retting and drying of the flax at a great heat in so-called "Haarhäuschen" is still customary. A one or two-clefted brake is used, and seldom only a proper hand-brake machine. Unfortunately, the establishment for steam-retting and swingling by machinery at Salnau, founded in the year 1854 by a company of shareholders, has failed, as did also a small establishment for dressing the flax erected at Oberplan, on the thrashing system (Göppelbetrieb). By establishing a flax market in the Bohemian Forest, for which purpose Budweis would be particularly suitable, the cultivation of flax in that part might be materially assisted, the trade in this staple product being at present carried on by native and foreign brokers only, who buy up stocks for the spinning factories at Krumau and Lambach, and more recently also for the spinning factories of northern Bohemia.

In consequence of the American war the flax industry of Bohemia has again improved and increased in extent, particularly through the introduction of flax spinning by machinery. The number of flax spinning factories in Bohemia is 38, most of these are situated in the districts of Iicin (Gitschim?), Königgrätz, and Leitmeritz.

The cultivation of flax in Moravia* ranks fourth amongst all the Crown lands of Austria, as regards the extent of the area devoted to its production; the same amounting to nearly 29,000 joch. The increase during the last 20 years has been considerable. It is cultivated most at the extremities of the Sudeten hills, namely, in the districts of Römerstadt, Altstadt, as well as at Neustadtl, where from 9 to 13·66 per cent. of the arable land is devoted to flax growing. In like manner Schönberg, Schildberg, Wiesenberg, Sternberg, Hof, Liebau, Zwittau, and Kunstadt cultivate about 49·10 per cent. of their arable land with flax. Of the districts of Moravia, situated near the Carpathian's Mountains, only those of Bistritz on Hastein, Roznau, and Nisowitz require special mention as favouring the cultivation of flax.

Special efforts to promote the cultivation of flax were successfully made in the districts of Moravian-Schönberg, and Moravian-Neustadtl, where as far back as the year 1866 preparations were made to introduce water-retting and the Belgian mode of dressing, which is particularly patronised, by appointing retting masters, with the aid of a grant from the Government.

A proof of this is furnished by the detailed reports bearing upon the subject, especially those of the Mährisch-Schönberg District Association. More recently, the Mährisch-Neustadtl Association, and other agricultural branch unions of Moravia, such as those at Friedland, Zwittau, and Römerstadt, devote themselves, in addition to that of Mährisch-Schönberg to the promotion of the cultivation of flax. It must also be recorded that the large landed proprietors in the western portion of Moravia have done a great deal towards introducing a rational method of flax-dressing, and that the flax dressing establishments of Counts W. Mitrowsky, and Egbert Belcredi, in particular, produce excellent water-retted flax.

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* See the statements on flax growing in Moravia, published in the reports on the condition of flax and hemp cultivation in Moravia, Silesia, and Bohemia, by the Ministry for Commerce and Agriculture, Vienna, 1865. Printed at the Imperial and Royal State Printing Office.

The school for agriculture and flax dressing to the building of which Messrs. Oberleithner of Mährisch-Schönberg have specially contributed, and in which the most suitable implements for dressing flax are employed, is of material influence on the promotion of flax-culture in Moravia. It must also be remarked in this place that this school is not only attended by natives of Moravia, but is visited also by inhabitants of other Crown lands. The great number of flax-spinning factories existing in Moravia likewise exercise a great influence on the promotion of flax cultivation, and a gratifying sign of this is not only the existence of many water-retting establishments and small buildings for dressing flax, but also the high price of 40 to 55 florins, which is paid for scutched flax. About 6,000 cwt. of the linseed obtained is annually crushed for obtaining oil, and used for domestic purposes (especially in the so-called Hanna district [Wischau, Kremsier, Ohnütz and Littau]).

Whilst the cultivation of flax in Moravia is on the increase, that of hemp is decreasing, and it is only met with in very isolated places and in small plots of land in the following districts: Auspitz, Boskowitz, Gaja, Littau, Sternberg, Meseritsch in Wallachia, Weisskirchen, Wischau, and Znairn. It is, however, more general, and in the hands of small landed-proprietors in the circuits of Göding, Holleschau, Hradisch, Kremsier, Olmütz, Prossnitz, and Ungarisch-Brod. Still, even there the products are only used for domestic purposes.

In Silesia the cultivation of flax is carried on nearly everywhere, with the exception of the flat tract of country round Troppau, Oderberg, and in the districts of Teschen, Freistadt, and Bielitz. The quantity produced every year is, however, mostly used for domestic purposes and is only sold in small quantities to the flax yarn-spinning factories in the country. Its cultivation is more extensive in the districts of Freiwaldau, Zuckmantel, Wiegstadtl, Freudenthal, Benisch, Odrau, Hotzenplotz, Jablunkau, Wagstadt, &c. A considerable retrogression with regard to the extension of this branch of culture has manifested itself in Sileaia since the year 1869, the area devoted to the cultivation of flax having been reduced from 6,133 joch (in 1869) to 3,998 joch (in 1872), so that a falling off of 2,135 joch is shown as compared with the former year. The cause of this retrogression is to be attributed partly to the bad harvests which have occurred for many years past, partly to the depressed prices of the article, and more especially to the want of labourers, which is always becoming more and more perceptible every year.

Dew-retting still prevails in Silesia. Water-retting is only used here and there, as in consequence of the low temperature of the water from the hills, it can only be employed where in autumn the waste water from the spinning-factories can be made use of. Dew-retting is also preferred because the small landed proprietors who have the cultivation of flax in their hands, prefer turning the flax-stems to account the same autumn, and rather forego the advantages they could reap in the ensuing summer from employing water-retting.

The efforts of the Agricultural Society of Silesia to direct attention to the advantages of the Belgian system both in sowing and reaping the flax, as well as in dressing the same, by the agency of travelling instructors and retting masters, have, unfortunately, not as yet been attended with the hoped-for success, the farmers not having found their account in the cultivation of flax, owing to bad harvests for several years past, and to depressed prices. They, therefore, fought shy of the preliminary expenses required in using water-retting pits, drying and scutching houses. Altogether there are only eight water-retting pits in Silesia, viz., those of Hermannsthal, Reicheldorf, Lichten, and Raase. There are besides several water-retting establishments connected with the flax-spinning factories at Freudenthal, Würbenthal, and Teschen, in which the waste water is used. Amongst the establishments for dressing flax, the machines for breaking and swingling the same in the spinning factories at Spachendorf, Freudenthal, Würbenthal, and Teschen deserve to be specially mentioned. For the last three years markets for the sale of flax combined with an exhibition of its staple products, have been established at Troppau, at which state prizes for excellently prepared flax and good linseed are distributed. Unfortunately, however, the participation at these exhibitions as well as at the flax markets has become smaller every year.

The trials of growing hemp formerly made by the Chamber of Commerce of Teschen have recently been discontinued, so that now it is not grown anywhere in Silesia.

Passing on to Gallicia, which contains a flax area of altogether 62,000 joch, just as much as Bohemia, and besides devotes about 50,000 joch to the cultivation of hemp, and being therefore the most important hemp-growing crown land of Austria, we will first of all direct attention to Western Gallicia.

Owing to the circumstance that the Gallician peasant has almost all his wearing apparel made of linen prepared at home, or at least of material he has himself produced, hemp and flax are grown for supplying domestic requirements in every commune where these plants if only barely thrive. Still the cultivation of flax and hemp in some districts of Western Gallicia has also a considerable commercial value, and the cultivation of flax is consequently chiefly prevailing there. Of the 30,000 joch which form 1½ per cent. of the arable area of Western Gallicia, about 1,000 joch are situated in the plain of the Vistula (especially in the districts of Tarnobrzeg, Kolbuszowa, and Mielec); 18,000 joch are in the clayey highland of the central tract of land (more especially in the districts of Myslenice, Biala, Wadowice, Pilzno, Jaslo, Lancut, Brzesko, Tarnow, and Krosno), and more than 10,000 joch in the hilly and mountainous districts (more particularly in those of Gorlice, Zywiec, Nowytarg, Limanowa, Sandec, and Grybow). In the district of the Vistula the area of flax-cultivation amounts to 0·3 per cent.; in the clayey highlands it amounts to 1·5, and in the mountainous districts to 2·5 per cent. of the whole arable area.

The yield of flax in the plain of the Vistula may be estimated at about 6,000 cwt. in the highlands at 90,000 cwt., and in the mountainous districts at 54,000 cwt., so that the total yield of flax represents a value of more than 4 millions florins.

In Western Gallicia the ordinary flax [Linum vulgare] (Slowien), as well as Greek flax, spring flax (Linum crepitans) is grown, which is there called Praglec or Prezec, and in Eastern Gallicia, Skoczen. Moreover, more spring flax is grown chiefly in the neighbourhood of Wieliczka, Myslenice, &c., because at those places the cold humid soil does not always allow early sowing of flax. Besides this, experiments were made with sowing Siberian flax (Linum perenne), but without success.

Lastly, the strong-branched wild flax which makes its appearance as a weed in oat crops, and is met with at the foot of the Patra chain of hills in the neighbourhood of Sandec, particularly near Narvojowa, in the damp valleys of Kamiouka and Woa-Mystkowska, is deserving of special mention; this is the white-blossoming *Linum catharcticum*, the seed and leaves of which possess special healing powers in the eyes of the Gallician peasantry, and are therefore gathered by them.

In Western Gallicia flax is generally grown after clover, followed by rye or oats, and then by potatoes in fresh manure, &c. This six-crop farming is more especially in practice in the well-conducted peasant farms near Laúcut and Zolynia. It may be generally assumed that the flax is only grown again in the same field in the tenth or twelfth year. Although precise rules as to the tilling of the fields, particularly as regards the cultivation of flax, are not observed in Western Gallicia, still the one is nevertheless strictly adhered to by the peasants, namely, that flax is not to be sown after potatoes on account of the appearance of *Cuscuta epilinum*. Only wealthy peasants use three-year old seed.

Notwithstanding the circumstance that the flax yields in medium years a clear profit of over 80 florins per joch, in which sum, however, the workmen's pay is not taken into account, the large landed proprietors have not as yet devoted special attention to the cultivation of flax in Western Gallicia, as labour and establishments for dressing the flax are wanting.

Water-retting is not customary in Western Gallicia; dew-retting is employed immediately after the harvest.

The flax is in general prepared for trade in a scutched state; in some neighbourhoods it is used for domestic weaving, which is especially the case in the districts of Krosno, Gorlice, Jaslow, Grybow, Neumarkt, and partly also at Myslenice. On the other hand, the scutched flax from the vicinity of Biala, Zolynia, Kosina, in the neighbourhood of Lancut, is sent by agents into other crown lands and to foreign parts, chiefly to Bohemia, Silesia, and Prussia.

The flax trade is largely developed in Zolynia, and the stock bought up by the agents is there cleaned in the winter, with the assistance of a large number of day labourers, dressed, and then sold (to Reichenberg).

Thus in the year 1871, 16,022 cwt. of flax were loaded at the station of Lancut, 2,925 cwt. at Przeworsk, and 1,618 cwt. at Rzeszow, for a conveyance over the frontier.

The importation of good flax seed from Riga, introduced by the Imperial and Royal Agricultural Society of Cracow, with the aid of State grants, has produced very good results. Of the linseed obtained in Western Gallicia, which may be estimated at 400,000 bushels; about 100,000 are used for sowing, and the remainder for the production of oil and for export as linseed. The oil factories at Cracow, Tarnobrzeg, and Nisko are to be mentioned in this respect. It is also to be observed that every small cultivator of flax presses out the necessary quantity of linseed oil required for domestic use by means of a hand rammer. About 200,000 cwt. of linseed are exported, and this, as well as the linseed cake, chiefly goes to or beyond Breslau.

To the cultivation of hemp in Western Gallicia, the following area is devoted:—

	Joch.
(*a.*) On the right bank of the Vistula, and as far as the Dunajec (especially in the districts of Dabrowa, Mielec, Kolbuszowa, Tarnobrzeg, and Misko) -	1,555
(*b.*) In the clayey highlands (Biala, Wadowice, Myslowice, Wieliczka, Bochnia, Rzeszow, Jaslo, Krosno, Tarnow, Lancut, &c.) - - - - - -	8,872
(*c.*) In the mountain districts (Zywiec, Nowytarg, Sandec, Limanowa, Grybow, Gorlice) - - -	1,300
Together - -	11,727

The spinning material is used in the manufacture of the necessary body-linen, and for cords and ropes required in the household. The cultivation of hemp furnishes an article of commerce only on the eastern boundary of the Lancut district near Przeworsk, where it joins that of Eastern Gallicia. The hemp seed is chiefly used for sweet-oil for the peasants, and as food for poultry and birds.

In Eastern Gallicia the cultivation of flax is of still more importance than in Western Gallicia. Since the abolition of socage service, it has, however, declined and become more confined to small landed proprietors. It is only recently that success has attended the efforts of the Gallician Agricultural Society at Lemberg, to give a fresh impulse to the flax cultivation in Eastern Gallicia, and in this respect the distribution of foreign seeds to large and small landed proprietors has been of especial service.

Unfortunately only dew and air-retting is chiefly employed; very seldom water-retting.* The school for flax cultivation already opened in March 1870, at Polana, and quite recently removed to Grzeda, in the vicinity of Dublany, will, it is to be hoped, soon afford the necessary instruction in this respect. At first Mr. Watteyne, and then Mr. L. Noskowski were entrusted with the direction of this school, which has hitherto been attended by 16 pupils, and with the delivery of lectures whilst travelling about. These gentlemen have, in turn trained under teachers who instruct the population carrying on the cultivation of flax in the various parts of the country.

The cultivation of flax is of the greatest importance in Eastern Gallicia in the districts of Lemberg, Kamionka, Rudki, Gródek, and Sanok. Of these the soil in the Lemberg district is most adapted to its cultivation, and in the more important villages of this district 30,000 cwt. of flax are, altogether, obtained, a considerable portion of which is sold at the annual fairs at Monaster, near Chrusno. Next to the Lemberg district those of Kamionka and Rudki are to be mentioned. In the former of these, however, the cultivation of flax is confined to the southern portion of the district.

The cultivation of flax is, however, diligently carried on also by the small landed proprietors in the South-western portion of the district of Brody, namely, in the neighbourhood of Ozidow. In the district of Rudki, flax is cultivated in the neighbourhood of Komarno; in the Gródek district, Gródek itself; Mikolajów in the Zydaczom district; and Swirz in the Przemysl district.

In the eastern and south-eastern districts of Eastern Gallicia the small landed proprietors grow flax only to cover domestic requirements. Along the lower range of the Carpathian mountains the cultivation of flax is more extensive, especially in the districts of Stryj, Sambor, Drohobycz, Sanok, and Brzozów. The average yield during the last three years may be estimated at 20 to 25 cwt. of flax-stems and at 3 korec† of linseed per joch. Moreover, of the 32,000 joch which are devoted to the cultivation of flax in Eastern Gallicia, it may be assumed that—

6,000	joch with	5	cwt. per joch yield	30,000	cwt. of flax.
7,000	„	6½	„	44,500	„
9,000	„	6	„	54,000	„
6,100	„	4	„	24,400	„
3,900	„	3½	„	13,690	„

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* Water-retting establishments are in existence only at Busk (Kamionka district), Brodka, Grzeda, Dublany (Lemberg district), and at Chorosnica (Mosciska district). Mud-retting has recently been employed at Rudki and Gródek. Amongst the establishments for dressing the flax, and drying houses, those at Grzeda, Dublany, and Komarno deserve mention.

† One Polish korec (Korzec = bushel) = 123 litres = 2 Vienna metzen, or bushels.

Of the flax coming to market about one third is in a scutched condition. The flax of Eastern Gallicia is chiefly sold to Moravia, Bohemia, Silesia, and Prussia. Unfortunately, however, it is not much liked in the factories there from the fact of its not being properly dressed.

Whilst the Gallician dealer tarries in foreign parts and seeks buyers for the flax, his relatives at home attend to the dressing and despatch of it, and debit the flax to be sent off with expenses on receipt, so that a very extensive advance business on flax consignments has developed itself. Recently, however, it has lost its former importance, as the stations of the Karl-Ludwig railway only pay the expenses in advance on flax consignments up to one third of the value.

The principal markets for flax are Monaster, Derewacz, Rudki, Gródek, Komarno, Kamionka, Busk, Sambor, Drohobycz, Sanok, Rymanów, and Dukla.

The returns of the Karl-Ludwig railway give some idea of the importance of the trade of Gallicia in flax and hemp. According to these returns, 130,400 cwt. of flax and hemp were forwarded on the line in the year 1871, of which 93,122 cwt went to foreign countries. The Flax Spinning Mill Company at Brody unfortunately uses not altogether Gallician flax, but covers one third of its requirements from Russia.

In the year 1871 the price of raw flax was quoted at 19 to 20 florins, of medium fine and scutched flax at 24 to 25 florins, of fine scutched flax at 27 florins, and of the finest scutched flax, prime quality, at 34 florins.

The cultivation of hemp is of still greater importance than that of flax in Eastern Gallicia. It is carried on everywhere, and is so universal that there is probably not one peasant's farm where at least a few garnetz * of hemp seed are not sown, even if it be only by sowing it in the furrows between beds of vegetables, or planting a narrow strip of it as a border around the fields of corn or vegetables, in order to protect the seeds from injury by cattle. The importance of the cultivation of hemp is also explained by the fact that the greater portion of the rural population wear clothes of materials made of it, the country population wearing cotton materials only on holydays. Hemp seed likewise plays a very important part, the oil, which is extracted by every peasant himself by means of a hand-press, being used during the numerous fasting days in the preparation of the viands. In fact, during Lent until Easter, there is scarcely a single family amongst the rural population of Ruthenia that uses any other fatty substance than this, as even milk is not allowed to be taken.

Whilst the cultivation of flax is of no importance in the south-eastern districts, it is just there that the cultivation of hemp is of greater extent, a proportion which is reversed in the highlands. About 200,000 cwt. of braked hemp fibre is the estimated average yield, and it may be assumed that of the 38,552 joch which are devoted to its cultivation in Eastern Gallicia—

	Cwt.
On 19·900 joch 4·55 cwt. per joch of hemp is produced, making - - - - - - - -	90·550
On 1·203 joch 5·1 cwt. per joch of hemp is produced, making - - - - - - - -	6·245
On 15·035 joch 5·82 cwt. per joch of hemp is produced, making - - - - - - - -	87·660
On 2·414 joch 6 cwt. per joch of hemp is produced, making	14·600

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* One garnetz (Garcy, $\frac{1}{32}$ korzec) is equal to 3·843 litres.

In the year 1872 the price of raw hemp was quoted at 14 florins, of hatchelled ditto at 21 florins, of fine hatchelled at 24 florins, of finest hatchelled at 27 florins; of hemp tow, medium quality, at 13 florins, and of ditto, best quality, at 15 florins.

The trade in hemp, however, is not very large, as it is mostly required for domestic purposes in the country. For it is only in exceptional cases that the large landed proprietors engage in the growing of it, and their crop is then generally purchased by tradespeople from Pesth. The most important hemp markets are those of Tarnopol, Mikulince, Ulaszkowce, Brzezany, Podhajce, Pýsmienica, Bolszowce, Zurawno, Uhnów, Stryj, Drohobycz, Rudki, Mosciska, Bircza, Rogi, Sanok, &c.

In the Bukowina the cultivation of hemp is undoubtedly of greater importance than that of flax, which in the plains is only carried on by German colonists, the inhabitants of Lippowa, and in the hilly districts by the small landed proprietors. The inhabitants of Lippowa, just alluded to, carry on the trade in flax above all things, and rent pretty large areas every year, but always only for three years, in order to sell the crop as it is on the field. New marshes are preferred on which to grow flax, and the care which the inhabitants of Lippowa devote to this culture is very remarkable, as they not merely till the soil well, but also use only three to four years' old seed, which is kept in barrels with the chaff. In consequence of this, the seed, notwithstanding the disuse of a change, has never as yet degenerated. In the flat country water retting is used, but in the hilly districts turf retting. The drying and breaking is unfortunately still done in a primitive way.

Hemp, on the other hand, which is not only grown as a separate crop, but also as an intermediary one, is of greater importance, as 5,595 joch are devoted to the former, whilst 90,000 joch are devoted to intermediary crops, between Indian corn. Separate crops of hemp are principally grown for obtaining bast, whereas the intermediate crops are exclusively intended for obtaining seed, since the bast obtained in the latter mode of cultivation is only of inferior value.

The spinning fibre is generally used for making articles of wearing apparel; and business is only done in it in case of need. The demand for hemp is unfortunately not covered by the production in the hilly districts, and therefore the custom prevails in the plains to purchase the crop of hemp on the stalk in the field.

The hemp seed is crushed quite raw for making oil, which is used on fast days. The remnants of the crushed seed are used as fodder, and as fuel in districts where there is a scanty supply of wood.

The figures in the appended table, in which the production is given very high, more especially in those districts where only a very small area is devoted to the respective cultivation, are subject to amendation.

From these figures there results an annual yield of spinning materials of, all together, 1,309,632 cwt. (=73,347,249·8 kilograms), of which 950,251 cwt. are scutched flax, and 359,381 cwt. hatchelled hemp. In like manner there is an annual yield of 1,707,268 cwt. (= 1,049,744·8 hectolitres) of seed, of which 1,035,157 cwt. is linseed and 672,111 cwt. hemp seed.

Thus there is shown to be an average yield of 4·79 cwt. per joch (=466·2 kilogrammes per hectare) of flax, 5·3 cwt. (= 515·8 kilogrammes per hectare) of hemp, 5·2 metzen, *i.e.*, pecks (= 5·6 hectolitre per hectare) of linseed, and 9·8 metzen, *i.e.*, pecks (= 10·5 hectolitre per hectare) of hemp seed.

If the cwt. of scutched flax is calculated at 22 florins, the cwt. of hatchelled hemp at 20 florins, the peck of linseed at six florins, and the peck of hemp seed at five florins, this gives a total value of the growth of flax and hemp for textile materials, amounting to 37·6 million florins, a result which nearly corresponds with that mentioned at the commencement of this paper, obtained from the various quotations of prices.

It may be added to this review that the flaxen yarn industry in Austria has increased of late. According to the statement of the Imperial and Royal Central Commission statistics, Austro-Hungary had in the year—

1862, 150,000 spindles at work in its factories for spinning flaxen yarn.
1864, 250,000 spindles at work in its factories for spinning flaxen yarn;
1866, 326,000 spindles at work in its factories for spinning flaxen yarn;
And in the year 1870 about 400,000 spindles at work in its factories for spinning flaxen yarn;

whereas since 1870 an increase in the number of spindles has not taken place. (For the rest, see the Return of the flax-yarn spinning mills in Austro-Hungary in the Annexe II., p. 697.)

It is to be seen from the official returns of the export and import trade in flax, hemp, Manilla hemp, &c., as well as in linen yarns, linen, and hempen goods, printed on pages 697 and 698, Annexes III. and IV., that the export under the first heading has declined during the last few years, its value, of more than 2,000,000 florins in the year 1864, having sunk to 1,500,000 florins in the year 1870. However, it rose again to 2,000,000 florins in the years 1871 and 1872.

On the other hand, the import of flax and hemp, &c. increases constantly, and rose in the year 1870 to 10·9 million florins in value, and in 1872 to nearly 12,000,000.

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—				arniola.
Area cultivated.	Flax	per-centage of acre ground -		2·7
		in jochs - - - -		6,389
		in hectares - - -		3,677
	Hemp	per-centage of acre ground -		1·1
		in jochs - - - -		2,609
		in hectares - - -		1,501
Production per Area.	Fibre	Broken flax	per joch in cwt.	2·18
			per hectare in kil	212·2
		Broken hemp	per joch in cwt.	6
			per hectare in kil	583·9
	Seed	Linseed	per joch in pecks	6·3
			per hectare in hec	6·7
		Hempseed	per joch in pecks	5
			per hectare in hec	5·3
Total production.	Fibre	Flax	cwt. - -	3,928
			kilograms -	0,051·6
		Hemp	cwt. - -	5,654
			kilograms -	3,717·9
		Both flax and hemp	cwt. - -	9,582
			kilograms -	3,769·5
	Seed	Linseed	pecks - -	0,251
			hectolitres -	4,749·1
		Hempseed	pecks - -	3,045
			hectolitres -	3,020·9
		Both linseed and hempseed	pecks - -	3,296
			hectolitres -	2,770·0
Value in florins.	Fibre	Flax	Average price per	16
			in florins -	3,848
		Hemp	Average price per	12
			in florins -	7,843
	Seed	Linseed	average price per	3·50
			in florins -	9,878
		Hempseed	average price per	6
			in florins -	3,270
			Total in florins - -	3,844

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ANNEXE II.

STATEMENT of the FLAX SPINNING FACTORIES at present existing in the AUSTRO-HUNGARIAN MONARCHY.

Country.	Place.	Proprietor.	Flax Yarn Spinning Mills.	Number of Spindles in 1870.	
				At work	Unemployed.
Upper Austria	Lambach	Shareholder company.	1	10,000	—
Bohemia	Various places	Different proprietors.	38	229,834	30,616
Moravia	Do.	Do.	11	55,568	—
Silesia	Do.	Do.	14	65,622	—
Galicia	Brody	Company of shareholders.	1	3,120	—
Hungary	Kesmark	Do.	1	2,816	—
		Total	66	367,955	30,616

ANNEXE III.

IMPORT of Flax, Hemp, Manilla Hemp, also Waste, Codilla (tow), Forest Wool, Sea Grass, &c., of Linen Yarn, Linen and Hemp Goods in the Years from 1864 to 1872.

ARTICLE.	1864–1866.		1867–1869.		1870–1872.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	zoll. cwt.	florins.	zoll. cwt.	florins.	zoll. cwt.	florins.
Flax, hemp, Manilla, hemp, Chinese grass, also waste, Codilla (tow), forest wool, sea grass, jute	1,015,544	24,471,160	1,170,009	27,220,031	1,472,553	32,712,657
Linen yarn, *i.e.*, yarns of flax, tow, and other vegetable substances	84,521	9,108,485	126,019	12,067,295	125,041	10,121,630
Linen goods, *i.e.*, woven textures, and rope wares of flax, hemp, tow, Manilla hemp, New Zealand flax, bast, sea and Chinese grass, forest wool, asbest, &c.	6,922	724,350	186,790*	6,507,818	265,899	9,746,037

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* Since 1867, in consequence of the treaties of commerce *plus* (mostly packing linen, grey, also sacks made thereof).

ANNEXE IV.

Export of Flax, Hemp, Manilla Hemp, also Waste, Codilla (tow), Forest Wool, Sea Grass, &c., of Linen Yarn, Linen and Hemp Goods in the Years from 1864 to 1872.

Article.	1864–1866.		1867–1869.		1870–1872.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	cwt.	florins.	cwt.	florins.	cwt.	florins.
Flax, hemp, Manilla hemp, Chinese grass, also waste, Codilla (tow), forest wool, sea grass, jute	262,481	6,382,293	200,696	4,806,156	237,700	5,629,784
Linen yarn, *i.e.*, yarns of flax, tow, and other vegetable substances	234,483	16,053,580	200,798*	14,048,340	320,564*	22,073,700
Linen goods, *i.e.*, woven textures and rope wares of flax, hemp, tow, Manilla hemp, New Zealand flax, bast, sea and Chinese grass, forest wool, asbest, &c.	351,369	31,742,414	332,621	47,813,137	405,956	52,995,459

* Increase in consequence of the Austro-German treaty of commerce which caused reduction of the customs unions import duty.

MR. E. C. BOWRA.

CHINESE MANUFACTURES SUITED TO ENGLISH MARKETS.

REPORT on the OBJECTS of CHINESE MANUFACTURE suited to English Markets, exhibited at the Vienna Exhibition.—By E. C. BOWRA, Esq.

Having been honoured with a request from Her Majesty's Commissioners to furnish them with a report upon the Chinese section at the Vienna Exhibition, I have much pleasure in submitting the following remarks, respecting the formation of the Chinese collection, the character of the articles which compose it, and its general bearing upon the commercial interests, present and prospective, of the United Kingdom.

The first step in regard to the formation of the collection, was taken in 1870, when the Chinese Government, in response to the appeal of the Austro-Hungarian minister, issued instructions to the effect that all articles intended for the Exhibition should be exempted from payment of duty on shipment at any of the Treaty Ports. In 1872, the Inspector-General of Customs, fearing lest want of acquaintance with the character of International Exhibitions, and ignorance of their beneficial influence and results, might prevent Chinese exhibitors from coming forward, undertook, on the special invitation of the Austro-Hungarian Government, to illustrate the part played by China in the international exchange of products, by supplying "samples and specimens of articles of trade and commerce, with statistical tables, exhibiting the movements of commerce and navigation at each port," during the ten years preceding the exhibition. The Commissioners of Customs at the Treaty Ports were accordingly instructed to prepare collections, consisting (A), of articles of merchandise received from foreign countries; (B), of articles of merchandise sent to foreign countries; and (C), of articles of merchandise carried coastwise between the Treaty Ports; while, with a view of illustrating Chinese art, industry, and manufactures, the Commissioners were further instructed to purchase specimens of miscellaneous articles peculiar to their several localities, and to receive on loan, for sale or return to the owners, any articles illustrative of interesting or instructive features of social life, or special and characteristic branches of industry, art, and manufacture.

The first two categories, illustrating the international exchange of products, form the basis of the collection; for, however unattractive they may seem to the general public, these specimens serve, in connexion with the special statistics, to explain "the mutual wants which foreign countries and China in turn feel and in turn supply." The samples and specimens under the third heading,—articles of merchandise carried coastwise between the several Treaty Ports,—serve to indicate the nature of the traffic in foreign bottoms, between certain important points in the Chinese empire.

Under these three headings then, is comprised nearly every item which comes under the comprehensive designation of Chinese commerce; while the articles from the several localities, supplemented by the extensive and valuable collections of Hu Taotai, the Venerable Archdeacon Gray, and others, illustrate with tolerable completeness, most branches of Chinese art and industry, many phases of Chinese social life and domestic economy, and some few striking peculiarities and characteristics of Chinese civilisation.

The ports which have contributed to the collection are 14 in number, *i.e.*—

1. Canton, in the province of Kwangtung, opened to British trade by the treaty of 1842. The province in which this port is situated, and of which it is the principal outlet, covers an area of 80,000 square miles, and has a seaboard of 600 miles. The population is about 19 millions, and good water communication exists throughout the province. In the Canton collection is included one from Kiungchow, in the island of Hainan, a port opened to foreign trade by the treaty of 1858, but as yet not resorted to by foreign merchants.

2. Swatow, in the same province, opened by the British treaty of 1858.

3, 4, 5, 6. Foo-chow and Amoy in the province of Fu-kien, both opened by the French treaty of 1842. The Fu-kien province has an area of 53,000 square miles, and a population of 15 millions. In the same political division is the island of Formosa, with the two ports of Taiwan and Tamsiu opened to foreign trade in 1858.

7. Ningpo, in the province of Che-kiang, containing an area of 39,000 square miles and a population of 21 millions. The port was opened by the treaty of 1842.

8, 9. Shanghai, opened by the treaty of 1842, and Chinkiang, opened by the treaty of 1858, both situated in the province of Kiangsu, containing an area of 45,000 square miles, and a population of 38 millions.

10. Kiukiang, opened under regulations decided upon by the British Minister and the Chinese Government in 1861. It is situated in the province of Kiang-si, which has an area of 72,000 square miles, and a population of 19 millions.

11. Hankow, opened at the same time as Kiukiang, is situated in the province of Hupeh, which has an area of 70,000 square miles, and a population of 27 millions.

12. Chefoo, opened in 1858, situated in the province of Shantung, which has an area of 65,000 square miles, and a population of 29 millions.

13. Tientsin, opened by treaty of 1858. It is situated in the province of Chih-li, which contains 59,000 square miles, with a population of 27 millions.

14. Newchwang, opened in 1858, situated in the province of Sheng-king, which has an area of 43,000 square miles, and a population of 6 millions.

Each of these 14 ports supplies a collection, more or less complete, under the several above-mentioned classes or categories. To avoid multiplication of samples, articles imported from Europe and America were collected and sent forward by one port only, Shanghai, the principal centre of the European import trade; but articles imported from Asiatic (not Chinese) and African ports, and from Australia and the South Pacific Islands, were collected at the several ports of entry. The following list (A.) will furnish a fairly correct estimate of the class of goods imported from other than European or American countries, and the second list (B.) of the native produce exported to foreign countries.

A.—FOREIGN GOODS imported into China, from other than European and American countries.

Classification.	Articles. Name in English.	Origin.
GROUP 1.—*Mining, Quarrying, and Metallurgy.*		
b. (Mineral ores) -	Tin - - -	Banca; Malacca.
c. (Other minerals) -	Borax - -	Thibet (imported viâ India); Ceylon.
GROUP 2.—*Agriculture, Horticulture, and Forestry.*		
a. (Plants for food and physic.)	Cloves - -	Islands of Amboyna, Timor, Banda, &c.
	„ mother -	
	Cardamoms, superior	India; Cochin China; Java.
	„ inferior -	
	Ginseng, Jap. & Cor., 1st quality.	Corea; Japan.
	Ginseng, Jap. & Cor., 2nd quality.	

Classification.	Articles. Name in English.	Origin.
	Mushrooms	Mongolia.
	Nutmegs	Banca Islands, Sumatra, Penang, &c.
	Pepper, black	Malayan Archipelago.
	„ white	
b. (Narcotics)	Betelnut	„ „ Annam; Hainan.
e. (Animal products in a raw state.)	Bezoar, Indian	Borneo; Cochin China.
	Elephants' bones	Cochin China; Siam.
	„ teeth, (broken).	„ Zanzibar.
	Elephants' teeth, (whole).	„ „
	Feathers, kingfishers'	Malayan Archipelago; Hainan.
	Horns, rhinoceros'	Siam; Cochin China; Sumatra?
	Shin, elephants'	Cochin China.
	Tortoise shell	Islands of Celebes, Ceram, Banda, Ternate, &c.; New Guinea.
	Wax, Japan	Japan.
g. (Products of forestry.)	Rattans	Malayan Archipelago; Cochin China.
	„ split	
	Timber, hardwood	Malacca; Cochin China.
	„ Kranjee	Malacca.
	Wood, Camagon.	
	„ Ebony.	
	„ Garroo.	
	„ Iron.	
	„ Fragrant.	
	„ Laka.	
	„ Rose.	
	„ Sandal.	
	„ Sapan.	

GROUP 3.—*Chemical Industry.*

a. (Chemical products for technical and pharmaceutical purposes.)	Camphor, baroos, clean.	Malayan Archipelago.
	Camphor, baroos, refuse.	
e. (Etherial oils)	Oil, ginger	—
	„ sandalwood	Bombay ?
	Rose maloes	Persia; India.
g. (Dye stuffs, mineral and organic.)	Cutch	Cutch (India); Pegu.
	Gamboge	Province of Chantibon, in Siam; Islands in Gulf of Siam; Cambodia.
	Mangrove bark	Singapore.
h. (Resins, washed, dyed, or bleached.)	Amber	Coasts of China Sea; Malayan Archipelago; Prussia.
	Gum, copal	Philippines; Malayan Archipelago; India.
	„ myrrh	India.
	„ olibanum	

Classification.	Articles. Name in English.	Origin.
	GROUP 4.—*Substances of Food, as Products of Industry.*	
g. (Preserves and extracts.)	Agar Agar	Malayan Archipelago; New Guinea.
	Bicho de Mar, Black	Timor, Celebes, Bali, &c.
	„ white	
	Birds' nests, 1st quality.	Java, Bali, Bantam, Borneo, Hainan, &c.
	Birds' nests, 2nd quality.	
	Birds' nests, 3rd quality.	
	Sharks' fins, black	Pacific and Indian Oceans.
	„ white	
	Opium, Malwa	India.
	„ Patna	
	„ Skin	
	GROUP 5.—*Textile Industry and Clothing.*	
b. (Cotton, cotton substitutes, cotton thread, cotton fabrics, and cords.)	Cotton (Indian)	India (Bombay, Calcutta); Siam; Cochin China.
c. (Flax, hemp, jute, and other fibres; yarns, threads, and fabrics of the same; straw fabrics for bonnets, screens, and mats; webs and cords of reed, cane, bast, hair, coir, &c.)	Manilla cordage	Philippines.
d. (Raw silk, spun silk, and manufactures of silk; silk wastes.)	Silk (Japan)	Japan.
	„ Tungking, (Yellow).	Tungking.
	GROUP 9.—*Stone, Earthenware, and Glass Industry.*	
a. (Stones, natural and artificial; slate and cement works.)	Jade stone	Persia; India; Australia.
	Cornelian stone	Guzerat.
	„ beads	
	Corals	Philippines; Sumatra; Timor; India.
	Pearl seeds	Bombay.
	GROUP 10.—*Small-ware aud Fancy Goods.*	
a. (Manufactures of ivory, meerschaum, tortoise shell, &c.)	Amber beads.	

B.—NATIVE PRODUCE exported to Foreign Countries.

Classification.	Articles. Name in English.
GROUP 1.—*Mining, Quarrying, and Metallurgy.*	
b. (Mineral ores and metals) -	Arsenic.
	Hartall.
	Marble slabs.
GROUP 2.—*Agriculture, Horticulture, and Forestry.*	
a. (Plants for food and physic) -	Tea, black, Congou.
	„ Souchong.
	„ Oolong.
	„ Orange Pekoe.
	„ Scented caper.
	„ Pekoe.
	„ Pouchong.
	Tea, green, Young Hyson.
	„ Hyson.
	„ „ skin.
	„ Twankay.
	„ Imperial.
	„ Gunpowder.
	Aniseed, star.
	Cassia Lignea.
	„ Buds.
	„ Twigs.
	Chestnuts.
	China root.
	Galangal.
	Ginger, green.
	Rhubarb.
	Olives.
	Seeds, melon.
	„ lotus.
	Turmeric.
b. (Tobacco and other narcotic plants)	Tobacco leaf.
d. (Cocoons of silkworms) - -	Silk cocoons.
c. (Animal products in a raw state) -	Feathers, fowls and ducks
	Horns, young deer.
	Hair, human.
g. (Products of forestry) -	Canes.
	Wax, yellow.
GROUP 3.—*Chemical Industry.*	
a. (Chemical products for technical and pharmaceutical purposes.)	Cantharides.
	Potashes.
c. (Fats and their products) - -	Vegetable Tallow.
e. (Etherial oils and perfumeries) -	Musk.
	Joss stick.
	Oil, peppermint.
f. (Matches, &c.) - - -	Crackers, fireworks.
g. (Dye stuffs, mineral and organic) -	Copperas.
	Nutgalls.
	Varnish.
h. (Resins) - - - -	Resin.

Classification.	Articles. Name in English.	
Group 4.—*Substances of Food, as Products of Industry.*		
a. (Flour and other farinaceous products; malt and its products.)	Cakes.	
c. (Spirits and spirituous liquors) -	Samshoo.	
g. (Preserves and extracts) -	Preserves.	
	Soy.	
	Meat, preserved.	
	Vegetables, preserved.	
Group 5.—*Textile Industry and Clothing.*		
b. (Cotton, cotton substitutes, cotton threads, cotton fabrics and cords.)	Cotton cords.	
	Native cloth.	
c. (Flax, hemp, jute and other fibres)	Hemp.	
	„ twine.	
	Grass cloth, fine.	
	„ coarse.	
	Matting.	
d. (Raw silk; spun silk and manufactures of silk; silk wastes.)	Raw silk, Cotngan -	Tsatlee or short reel.
	„ Kowkong -	
	„ Machun -	
	„ Suitang -	
	„ Kuchun -	
	„ Kongmi -	
	„ Loongkong -	Long reel.
	„ Mahang -	
	„ Hantang -	
	„ Seulam. -	
	„ Cumchuck -	
	„ Laklow -	
	„ Satow - -	
	Silk, re-reeled, Cotngan -	Short re-reeled silk.
	„ Laklow -	
	„ Laklow, long re-reeled silk.	
	„ thrown, organsine or warp, 2 threads.	
	„ thrown, organsine or warp, 1 thread.	
	„ thrown, tram or woof, 2 threads.	
	„ „ boiled and prepared for the loom.	
	„ waste.	
	„ raw, wild.	
	„ floss, Canton.	
	„ „ other provinces.	
	„ threads.	
	„ piece goods.	
	„ fish lines.	
e. (Smallware manufactures, gold and silver cloths and embroideries.)	Embroideries.	

Classification.	Articles. Name in English.
h. (Finished objects of clothing) -	Silk clothing.
	Shoes, straw.
	Hats „
	„ felt.
	Skin clothing.
	Caps, felt.
	Pouches.
i. (Upholstery, carpeting, curtains, bed furniture.)	Table covers.

GROUP 7.—*Metal Industry.*

a. (Goldsmiths' and silversmiths' work, and jewellery, &c.	Gold ware.
	Silver.
	Gold thread, imitation.
	Silver „
	Copper ware.
	Pewter „

GROUP 8.—*Wood Industry.*

b. (Joiners' work) - - -	Wood ware.
	Bamboo ware.
	Furniture.
	Hardwood planks, &c.
i. (Basket work) - - -	Rattan ware.

GROUP 9.—*Stone, Earthenware, and Glass Industry.*

a. (Stones, natural and artificial, slate and cement works.)	Ink stones.
	Buttons, cap.
	„ fancy.
b. (Earthenware) - - -	Chinaware, fine.
	„ coarse.
	Earthenware.
c. (Glass manufactures) - -	Glass bangles.
	„ beads.
	Pictures, glass.
	Lamps.
	Corals, false.

GROUP 10.—*Small-ware and Fancy Goods.*

a. (Manufactures of ivory, meerschaum, tortoise shell, mother of pearl, whalebone, wax wares, japanned goods.)	Ivory ware
	Tortoise shell ware.
	Mother of pearl ware
	Bone ware.
	Lacquered ware.
	Sandalwood „
	Amber ware.
	„ beads.
	Beads, scented.
	„ fancy.

Classification.	Articles. Name in English.
c. (Umbrellas, parasols, fans, canes, whips, etc.)	Fans, feather.
	„ gauze and fancy.
	„ paper.
	„ palm leaf, trimmed.
	„ „ untrimmed.
	Umbrellas, silk.
	Kittysols.
	Lanterns.
	Curiosities.
e. (Toys) - - - -	Toys.
	Ornaments.
	Pictures (rice paper).
	Spectacles.

GROUP 11.—*Paper Industry and Stationery.*

b. (Coloured paper, paper hangings, tapestry, playing cards, &c.)	Paper, oiled.
	„ ware.
	„ rice.
d. (Articles for writing, drawing, and painting.)	Ink, China.

GROUP 13.—*Machinery and means of Transport.*

	Scales and weights.
	Sundials.

GROUP 15.—*Musical Instruments.*

a. (Musical instruments) - -	Drums.

The articles of merchandise received from Europe and America consist principally of manufactures, cotton goods, woollen goods, and metals, the thousand and one other articles which complete the collection and swell the returns, being of comparatively minor importance.

These manufactured goods are too familiar for the specimens exhibited to attract much attention or excite much interest. They have, however, the merit of illustrating, in a very practical way, the special Chinese needs which Great Britain is able to supply, while the progressive character of the trade is sufficiently indicated by the following table:—

QUANTITIES and Values of some of the principal Articles of English Manufacture imported into China during the Years 1868–1872.

—	—	1868.		1869.		1870.		1871.		1872.	
											Taels.
COTTON GOODS :—											
Shirtings, grey, plain	Pieces	4,921,831	10,194,295	5,095,206	9,368,236	4,623,831	8,422,318	3,077,796	14,506,665	4,649,497	9,090,038
" white, plain, and figured	"	657,768	1,671,338	600,761	1,250,159	792,728	1,560,681	664,877	1,351,897	677,940	1,315,158
" dyed " "	"	143,777	360,042	103,757	311,881	149,391	367,931	168,489	483,966	132,003	317,985
T-cloths	"	2,058,741	8,649,029	3,112,476	5,509,715	3,174,758	4,847,301	4,182,763	5,680,012	5,018,948	8,754,416
Drills	"	358,806	1,274,797	821,289	2,667,165	692,634	1,898,499	778,845	2,091,360	1,087,569	3,028,489
Sheetings	"	47,674	177,867	95,823	301,247	7,195	21,480	56,554	193,122	139,006	397,150
Jeans and twills	"	44,533	147,832	194,705	600,848	236,276	508,744	189,699	393,651	410,047	818,043
Chintzes, furnitures and prints	"	240,349	391,844	187,140	295,862	424,964	576,512	184,991	172,256	204,991	269,925
Turkey red cloths and cambrics	"	84,256	181,634	120,263	242,349	117,539	241,657	100,490	199,600	99,278	176,358
Damasks	"	38,616	142,888	6,959	26,892	3,769	17,138	22,001	102,640	21,146	90,824
Velvets, velveteens, and fustians	"	68,312	396,640	88,534	522,645	105,104	565,346	33,778	162,649	20,706	138,626
Handkerchiefs	Dozens	201,992	118,840	150,240	79,039	153,168	85,034	266,041¼	142,693	331,663	165,726
Cotton goods, unclassed	Pieces	125,818	232,119	97,098	214,972	108,291	264,668	82,384	139,113	163,565	265,776
" yarn and thread	Peculs	56,244·89	1,670,531	52,964·92	1,321,726	67,116·03	2,020,396	70,062·57	1,859,746	51,427·31	1,404,059
Cotton goods, total	Hk. Tls.	-	20,609,696	-	22,712,736	-	20,897,655	-	27,480,070	-	24,232,518
WOOLLEN GOODS :—											
Camlets, English, Dutch, and imitation.	Pieces	124,202	1,501,144	138,468	1,526,986	112,200	1,137,394	80,262	[851,566	69,334	951,153
Cloth, broad, habit, medium, &c.	"	25,898	618,329	32,500	762,575	58,024	1,648,148	36,604	984,903	35,500	896,268
Spanish stripes	"	72,496	852,387	88,966	1,063,592	75,680	709,184	66,347	637,013	55,901	617,797
Lastings	"	49,795	482,805	63,758	552,663	91,323	687,128	55,907	492,215	86,078	345,252
Long ells	"	179,411	1,069,663	138,751	865,533	212,277	961,588	112,989	514,797	91,844	494,945
Lustres and Orleans, plain and figured.	"	323,627	1,462,034	237,488	962,306	272,257	857,011	288,174	905,410	324,741	1,187,137
Woollen goods, unclassed	"	44,439	207,743	98,179	354,007	79,139	362,180	43,355	190,720	32,572	175,334
Woollen goods, total	- -	819,868	6,194,175	793,110	6,087,662	900,899	6,862,633	683,638	4,576,624	645,970	4,667,886
METALS :—											
Iron, nail rod, and bar	Peculs	252,186·28	605,002	392,504·38	816,188	339,750·96	634,555	176,392·39	332,956	222,230·22	606,455
Lead, in pigs	"	157,557·15	969,569	213,069·31	1,059,270	271,491·02	1,163,849	130,126·31	571,805	84,775·81	379,708
Quicksilver	"	6,025·71	289,447	4,729·47	212,329	3,251·26	163,026	3,782·21	241,636	3,861·60	257,288
Tin, in slabs	"	43,063·20	786,268	38,195·30	646,656	35,733·94	775,649	35,677·01	573,879	39,848·12	933,979
Metals, unclassed, and ware	Value	-	464,056	-	603,442	-	896,098	-	487,589	-	684,170
Metals, total	Hk. Tls.	-	3,014,335	-	3,337,885	-	3,437,177	-	2,207,865	-	2,861,600

NOTE.—Roughly speaking, three taels are equal to 1*l*.

Piece Goods.—It has been computed on official authority, that the annual average individual expenditure of the natives of British India on material or clothing is about 10*s.* per head. Owing to the greater rigour of the winter, and the wider range of latitude, the expenditure of the Chinese is probably considerably larger. The extraordinary prudence, frugality, and poverty of the Chinese tend to keep the expenditure of the lower classes at a minimum, but the expensive silks and furs of the higher and middle classes redress the balance, and render the average expenditure of 10*s.* below, rather than above, that of India. Accepting this average, however, as a basis, we may assume that the sum of 150,000,000*l.* is annually expended by Chinese in the purchase of materials for clothing, and of this sum, the value of the foreign goods imported, represents the portion which is supplied by European looms.

The actual value of the cotton and woollen goods imported into China during the year 1872, was under 10 millions sterling; a very small proportion of the total expenditure, and far below the consumption anticipated when the first treaties with China were entered upon. It is often assumed that the cause of this limited consumption of foreign goods, is to be found in official obstinacy, obstructions in regard to internal transit, local prejudices, ignorance, and superstition; but experience is beginning to demonstrate, that the main obstacle to the indefinite expansion of British trade in manufactured goods, is in reality the manufacturing power of the people, and the peculiar character of Chinese social economy, which enables the ordinary farmer to work up on his own farm, without the aid of machinery or workmen, the material which he has grown on his own land. This is one of the principal causes which make the Chinese independent of foreign supply, although it is in direct practical contradiction to that axiom of political economy, which refers the greatest improvement in the productive powers of labour to the division of employments. The Chinese farmer cultivates his own cotton, or obtains it in direct barter for the produce of his own fields, constructs his own simple yet effective machines, and cards, spins, and weaves the raw material, without other assistance than that of his own family. Each farmhouse and village is thus able not merely to supply its own wants, but has probably a surplus to dispose of, at little more than the cost of the raw material, to the artificers and shopkeepers of the neighbouring towns. The principal consumers of British cotton goods are among the well-to-do classes,—those who can afford frequent renewal of clothing, and are willing to dispense with extreme durability in favour of gloss and novelty. Considering, therefore, the comparatively limited class of consumers, the progressive demand for foreign piece goods—though it does not fulfil the expectations of the envoy who signed the treaty of Nanking in 1842, who stated that a trade had been opened up so vast, "that all the mills in Lancashire could not make stocking "stuff enough for one of its provinces"—is satisfactory enough, especially when it is borne in mind that these fabrics have to compete with native goods, adapted to the requirements of the people, and produced at a minimum cost, by means of unpaid household and domestic industry, in a country remarkable for the thrift, untiring diligence, and persevering application to labour of its inhabitants.

Metals.—The specimens of metals imported into China are very numerous, though the annual value of the total importation is under a million sterling, and the prospects of any expansion of the trade appear very vague and doubtful. It would, indeed, seem more than probable, that the importation of metals will be checked and lessened in the course of a few years, by the opening of native mines, and the application of foreign machinery and appliances. Official obstructiveness and dread of change, are being gradually overcome, popular ignorance and superstition are being surely though slowly undermined, and there seems fair reason to hope that the leaven of progress is already working, and is likely to achieve important results in this direction. The Chinese are eminently quicksighted and practical, and are by no means averse to change whenever it appears conducive to their own interests. They are peculiarly amenable to reason, they are free from all caste prejudices, and they have no intolerant religious bias. They have adopted many improvements from other nations in the course of their history, and the progress of the past 20 years, justifies the expectation, that the mineral resources of the Empire will, at no very distant date, be developed and utilized.

Iron.—Under the present primitive system of extraction and working, native iron (of which some excellent specimens are exhibited by M. Giquel, director of the Arsenal at Foochow) is very expensive, and is unable to compete with foreign by reason of its cost. It has been suggested that, if iron implements and tools of every kind, were made at Birmingham and Sheffield, on Chinese models, without change or alteration, they might become articles of commerce. An effort has been made to introduce American machine made nails, but the experiment was unsuccessful. Native iron is softer, more ductile, and less brittle than foreign, and is capable of being worked up several times; hence its preference is obvious and natural. Moreover, machine made nails have not yet superseded, even in Europe, the nails made by hand, and, so long as the nailers of Worcestershire and Warwickshire, find it possible to pursue their handicraft, it is needless to expect that the lower priced labour of Chinese will be driven out of the field. Despite the failure of foreign nails to find a market in China, it seems, therefore, possible, that tools and implements of husbandry might find and supply an existing demand.

Quicksilver.—The quicksilver which is exhibited among the specimens of imports, is supplemented by the samples of cinnabar from Kueichow and Canton. Foreign quicksilver fluctuates largely in price, and the quantity annually imported varies greatly in consequence. It is employed in the extraction of ores, in forming the reflecting surface of looking-glasses, and in medicine, in which it forms the basis of innumerable prescriptions. The native cinnabar is collected in red crystals and purified by sublimation. It is then put into water, levigated, and finally dried on tiles in the sun. The uses to which vermilion is put are numerous. Red is supposed to be a colour of good omen and is more largely employed than any other. It is perhaps worthy of remark, that the great Chinese *Materia Medica*, published in 1596, includes and describes a vegetable quicksilver, said to be identical in properties, appearance, and all save origin, with the mercury of European commerce. This vegetable quicksilver is said to be extracted from the stems and stalks of the Purslane (*Portulaca oleracea*). The process of extraction is detailed at length, and in a most circumstantial manner in the Chinese Herbal. Whether there be any possibility of truth in the notice must be left for scientific observers and experimentalists to decide.

Needles.—The needles exhibited are manufactured from iron wire. Foreign machine made needles have diminished the demand, but the native make, clumsy and costly as they are, still hold their own. They do not rust in the hand of the workman, they are made in a shape adapted to the requirements of the material, and have been known and sanctioned by prescriptive usage during many generations.

Tin.—The tin which figures largely among metal imports, is used in the manufacture of tin foil for sacrificial paper money, and pewter ware for household use. Chinese pewter is softer and more ductile than European; it is also much esteemed on account of its freedom from verdigris. Tin has long been an article of import into China, and was brought from Malacca in native junks, before the opening of European trade. The Dutch settlements in Sumatra gave Holland an almost undisputed monopoly of the early trade with China in this metal, so far at least as European commerce was concerned. The East India Company attempted to break down this monopoly in 1780 by the introduction of purer tin from Cornish mines. But the high price of the Cornwall tin prevented it from competing with that from Banca, notwithstanding its superior quality. The Banca tin is mined and smelted by Chinese settlers, and a large trade is still carried on in native bottoms.

Native Produce.

Of the native produce carried coastwise from port to port, of its extent, variety, and interest, the specimens included in the collection afford a very sufficient and satisfactory illustration. The textile fabrics, the home-spun cloths which prove such formidable rivals to British manufactures, the hemp-cloth, grass-cloth, and bamboo cloth, flax, jute, reed, and other fibres, are all represented, and these specimens are of great interest and value, as showing the power and capacity of Chinese handicrafts and domestic industry to compete with British machinery and scientific skill.

It would be tedious to enumerate the multifarious items which compose the list of native produce, the most important of which are included under the headings of substances of food as products of industry; leather industry; manufactures of metal and alloy; wood industry; stone, earthenware, and glass industry; slate and cement; paper industry; textile fabrics; dye stuffs; animal products; resins, and plants for food and physic. The trade in this last named item, is of great value and importance, and perhaps no part of the Chinese collection is more full of interest to scientific observers, than that which comprises the contents of the Chinese Pharmacopœia. Hitherto opportunities for investigation have been much restricted, and qualified labourers in the field have been few. The botany of Southern China has, indeed, been investigated and classified by the scientific exertions of Dr. H. F. Hance, Her Majesty's vice-consul at Whampoa, and the labours of Père David, Mr. Williamson, Dr. Bretschneider, Mr. Swinhoe, Dr. Williams, and others, have sufficed to show how important is the field which still remains to be explored. The specimens exhibited at Vienna will serve to illustrate in a general way the character of Chinese medicine, and the limited extent of Chinese scientific knowledge; but the collection may serve at the same time a more important purpose, in assisting in the identification with medicines known in Europe, of many articles of which the origin and properties have been, at present, but partly investigated.

Materia Medica.

The Chinese have no scientific acquaintance with chemistry, and hence their mineral products employed medicinally, are used for purposes which our own researches would not sanction.* Many substances are made use of which are devoid of all medicinal properties, while others are so administered that the effect must be extremely variable and uncertain. Most of the mineral drugs are used crude, but some, such as mercurials, are the result of chemical operations evidently conducted with considerable skill.†

The collection offers many curious evidences of ignorance and superstition, but it affords also, many interesting proofs of the empirical success which has attended the researches and experiments of the Chinese medical profession. In the following notes of drugs included in the collection, it is not presumed to exhaust the subject, or even to describe those best known and most frequently employed; but it would seem probable that a few memoranda, however imperfect and inexact, may be of some interest and value to British druggists and chemical manufacturers.

Tang-shen is a species of ginseng grown in Shangtang in the south-west of the province of Shan-si. It is considered inferior to the Manchurian and Corean ginseng, and has been in a great measure supplanted by the more valued drug. At present it is used principally by poor persons in all ailments where ginseng is recommended; its price is about 5*l.* per pecul of 133⅓ lbs.

Tang-kwei.—This medicine is described by Dr. Hanbury in his Notes on Chinese *Materia Medica*, as a fleshy branching root, in size, shape, colour, and general appearance resembling gentian. He ascribes it to the root of *Aralia edulis*, now known as *Dimorphanthus edulis*. It is recommended by Chinese doctors in fevers, colds, and disease of the heart. The price is 8*l.* for every 133⅓ lbs.

Hwang-ch'i.—This is the dried root of an herbaceous plant cultivated in the province of Shan-si, where it grows to the height of two or three feet. In early autumn it bears a yellow and purple flower, and its seeds are contained in a pod about an inch in length. The root is 6 or 8 inches long, of a yellowish white, with a thick rind and pithy centre. It is used in the cure of ulcers and as an emollient; in cases of deafness, and as a general tonic. It is classed by Hoffmann and Schultes as *Ptarmica sibirica*. The price is about 8*l.* per 133⅓ lbs.

Sheng-ti is the unprepared root of the plant better known as *Ti-hwang* and is largely produced in the province of Ho-nan. By Abbe Grosier it is identified with *Symphytum officinale,* valued in Europe on account of its mucilaginous and astringent properties. The roots are conical, about two inches long; they are covered with a brown cuticle, and when opened, exhibit a close surface of a dark purple colour. It is used as a febrifuge and blood purifier, and its price is about 1*l.* 15*s.* per 133⅓ lbs.

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* See Dr. Hanbury's invaluable "Notes on Chinese Materia Medica."

† Dr. Hanbury's "Notes on Chinese Materia Medica."

Tu-chung is the bark of a tree of which the leaves are used as a vegetable and are reputed a certain cure for dyspepsia. The bark is of a light brown colour, and when pulled discloses a web of glossy white threads. The *Tu-chung* has been identified by Hoffmann and Schultes as *Evonymus japonicus* of the order *celastroceæ* or spindle trees. An infusion of the bark is administered as a tonic and strengthening medicine in case of debility from age or other causes. It is valued at 17*l.* per 133⅓ lbs.

Niu-hsi is the root of a shrub three or four feet high, with coloured stalks and leaves. Dr. Porter Smith thinks it is the *Pupalia geniculata,* but by Messrs. Hoffmann and Schultes it is identified with another plant of the same order, *Achyranthes aspera.* It is said to turn gray hair black, and is administered in cases of difficult parturition and for the dispersion of humours and ulcers. Its price is 8*l.* per 133⅓ lbs.

Ch'i-tzu is the seed of a shrub (*Lycium Chinense*) which grows three or four feet high, flowers in the middle of summer, and bears small red berries in autumn. It is valued at 30*l.* per 133⅓ lbs.

The *Shan-yo* is the heart of a sort of yam. It is prescribed in cases where nutritious medicines appear to be required, and is recommended in dyspepsia. It costs 50*l.* per 133⅓ lbs.

Peh-chu is the dried root of a plant cultivated extensively in the Chekiang province. The Chinese herbal says it was formerly known by the names "sky thistle" and "hill mustard" because its leaves and flowers resembled those of a thistle, and the flavour of its root was sharp and biting like mustard. The plant has been identified with *Atractylodes.* The roots are collected in autumn and dried over a slow fire. They have a sweet mild taste, and are slightly aromatic. They are used as a tonic, a digestive, and restorative in cases of debility. Its value is 2*l.* 15*s.* for every 133⅓ lbs.

Pei-mu is largely grown in the provinces of Chekiang and Sze-chuan. Messrs. Hoffmann and Schultes class the plant as a bell-wort, (*Liliaceæ uvularia*). The Chekiang bulb is much coarser than the one produced in Szechuan, and commands a price of only 1*l.* 15*s.* per 133⅓ lbs., while the Szechuan root costs about 30*l.* per 133⅓ lbs. *Pei-mu* is prescribed in cases of fever, ague, and calculus, and is also used as a lacteal stimulant, and as an expectorant.

Yuan-shen, black ginseng, is said by the Chinese, to be identical in all save colour and quality with the better known ginseng of Manchuria. It is used in fever, and also to allay feverish symptoms after childbirth. The value is 12*s.* per 133⅓ lbs.

Mai-mên-tung consists of the tubes of a plant identified by Dr. Hanbury with *Ophiopogon japonicus.* It is used as a tonic and gentle stimulant, and is prescribed as a remedy in case of bilious fever. The price is 3*l.* 10*s.* per 133⅓ lbs.

Chu-yu-ju, valued at 1*l.* per 133⅓ lbs., is the fruit of a shrub identified with *Cornus officinalis.* The fruit is like a small wild date, and is used as a febrifuge and vermifuge.

Pien-tou is the seed of a vigorous ornamental creeper with large leaves and a small white flower (*Lab-lab vulgaris?*). The pods are long and the seeds are sometimes black and sometimes white; the white only are used as a medicine, which is supposed to strengthen the digestive powers of the stomach. While unripe the bean is used as food, but only in small quantities, as it is considered certain to bring on fever and ague.

Shih-ch'ang-p'u, Acorus calamus, a sort of flag which makes its appearance in spring. It has green lance-shaped leaves from one to two feet in length, crooked and jointed roots, dark brown in colour and resembling frayed cordage. Its roots are prescribed for colds, coughs, and diseases of the lungs.

Lou-pi, the peel of a species of gourd grown in Chekiang; it is used as a strong purgative fully equal to jalap. Dr. Porter Smith classes it as Bryonia.

Shan-ch'a is the fruit of a small bush (*Cratægus cuneata*) growing wild on the hills. A decoction of the fruit is prescribed, internally, for dysentery, and, externally, for diseases of the skin.

Pai-Chih is the rhizome of a small perennial (*Iris Florentina*). The root is used as an emenagogue and a stimulant. It bears some resemblance to the orris root formerly used as a stimulant in European medicinal preparations, but now disused as medicine and employed only in perfumery.

Sang-pai-pi, a medicine used for purifying the blood, is the inner bark of the root of the mulberry.

Hsia-ku-tsao is the dried flower of a common grass. It has an angular stem, grows from one to two feet in height, and bears a small purple flower which ripens into ears like wheat. It is used principally in the cure of tumours and external sores.

Ch'un-hua consists of the small floss-covered buds of the *Magnolia yu-lan* picked before fully expanded. They are employed as a powerful stimulant and tonic, and are said to be an antidote against certain poisons.

Ch'ienhu (*Smilax carex*) is a root of a dark coloured exterior and pithy centre, with a slight smell resembling sarsaparilla root and a bitter sickening state. It is administered chiefly in asthma and diseases affecting the respiratory organs.

Pai-ch'i, the small tubers of an herbaceous plant found among rocks. The tubers are mucilaginous, bitter, glossy, and translucent. They are principally employed to purify the blood.

Hwang-chü-hwa, the dried flower heads of the yellow *chrysanthemum*. It is used as a decoction for disorders of the head and eyes, in diseases supposed to arise from fevers or heat in the body.

Tien-mên-tung, fleshy translucent tubers of the *Melanthium Cochin Sinense*, varying in size from the thickness of a writing quill to that of the little finger, and often three and a half inches in length. Loureiro, quoted in Dr. Hanbury's notes, states that this drug is regarded as a diaphoretic and expectorant, and that it is administered in phthisis.

Wu-kung or centipedes are caught about buildings or are bred in covered jars. The Chinese physicians believe them to have the power of driving out the poison from external sores. Burnt crisp, and mingled with samshoo, they are said to be a never-failing remedy for worms.

Ch'i-shè. These are snakes from one to three feet in length, common throughout the coast provinces. The country people hunt them and dry them over a slow fire. The physicians believe this snake, from its disposition to take refuge in holes and crevices when alive, has, when mixed with medicine, a power and tendency to secrete itself in the most intricate parts of the body.

The foregoing are merely a few of the many specimens of drugs and medicines comprised in the Vienna collection. Many of these officinal plants, though they have not any place in the western pharmacopeia, are held in high repute by native physicians. Some of them are credited by Chinese with fantastic and impossible properties, and are reported to have an efficacy little short of the miraculous; others, however, recommended by the practice and experience of many generations, well deserve examination, and might possibly be found worthy of introduction into Europe.

Native Produce.

Among the specimens of native produce exhibited, the most important are naturally those which represent the staples of export to foreign countries, tea, silk, rhubarb, &c., &c. These are so well known, and have been so often described, that it is needless to mention them here. Among the minor articles of export and coast trade, however, are many items comparatively unknown to English commerce, but sufficiently important in their natures, properties, or applications to call for a passing notice in this report.

Vegetable Tallow.—The specimens of vegetable tallow exhibited, represent a trade of some importance, though confined entirely to Chinese hands, and carried on exclusively between Chinese ports. In the central provinces of China the tallow tree, or "*Stilingia sebifera*," is extensively cultivated on account of its extraordinary utility and multifarious applications. From its leaves a black dye is prepared; the seeds furnish the tallow, and the kernels, when crushed, yield an oil, which is said to possess, among other properties, that of changing grey hair to black. The refuse of the seeds furnish a manure of special efficacy in the cultivation of tobacco, and the bark is used as a medicine. The seeds which furnish the tallow are contained in a three-lobed berry, surrounded by a white fatty substance, disclosed when the seeds are ripe, by the bursting of the capsule. This seed is crushed and boiled, the fat rises to the top and is skimmed off, run into moulds, and suffered to cool in cakes of about 80 lbs. weight. The average cost of this vegetable tallow is 2*l.* 15*s.* per 133⅓ lbs., a price which prevents it from entering into competition in the European market with the animal tallow of Russia and Uruguay. The vegetable tallow of Singapore, made from the seeds of a species of mangosteen, is, however, imported into England for the use of candle manufacturers, and it is not altogether impossible that inspection of this little known Chinese product by experts, may result in its introduction as an article of commerce into the London market.

Hemp.—The specimens of Chinese hemp included in the collection are much coarser and darker than the European exhibits, and contrast most unfavourably with the Russian, Polish, and Italian specimens. Yet hemp has been cultivated in China from time immemorial. The earliest classics refer to it; the great sages and founders of Chinese philosophy, Confucius and Mencius, allude to the plant in a way which implies its early use, and the Chinese character by which it is represented is an original one, and thus favours the supposition that the plant is indigenous to the country. The Chinese hemp is perhaps rendered coarse by the conditions of cultivation. Strong rank soils, with much manure, are required to force the young plant into upward growth, and thus lengthen the fibre; and the close sowing practised with a view to check lateral, and force upward, growth, perhaps deprives the hemp of those finer qualities which, under the exposure to light and air, it developes in localities where the conditions of culture are more favourable. The Chinese are unacquainted with the stimulant known in India as "bang," prepared from the leaves and green part of the plant, and it is not improbable that the Chinese method of cultivation prevents the plant from secreting as fully as it would otherwise do, the resinous principles natural to it.

Isinglass.—The exhibits under the heading of isinglass, among the imports is not the isinglass of European commerce, but is made of the noses and sounds of a species of carp found in the Ganges. It is thus a kind of fish glue, and is prepared in thin diaphanous sheets, used in painting; in giving a lustre to silks, and in the manufacture of Indian ink. It has countless uses, but is not employed as an article of food. In addition to this import, however, there is a second exhibit also under the head of isinglass, consisting of clarified seaweed, used solely as an edible, and not employed for any manufacturing purposes. The isinglass of European commerce was formerly obtained from the dried air bladders of only one kind of fish, the sturgeon. The progress of science and the necessities of commerce have, however, led to the discovery that the air bladders of many other species of fish may be also employed, and the supply has proportionately increased. On the suggestion of Professor Owen, who called the attention of the Canadian Commissioners for the Exhibition of 1851 to the subject, the preparation of isinglass was introduced into Canada, where it soon established itself as a profitable industry; and it is perhaps worth inquiry whether a similar preparation might not be made from the air bladders of some of the innumerable species of fish which are found on the Chinese coast.

Arsenic.—The Chinese arsenic exhibited is found in the central provinces, and is largely used in agriculture, especially in the destruction of worms and insects in rice-growing districts. Its poisonous properties are well known, and the public safety is protected by restrictions against its indiscriminate sale. A sulphurate of arsenic, known as *hartall*, is found in the south-western provinces, and is used as a yellow paint. The several specimens exhibited are of varying shades, and the price ranges from 5*l.* to 8*l.* per pecul = 133⅓ lbs.

Star aniseed.—This is the fruit of a small evergreen tree (*Illicium anisatum?*) growing in the south-western provinces. The fruit is star shaped, and consists of several hard woody carpels, each containing a bean-like kernel of yellowish colour and sweet taste. It is sent from China to Europe, and is employed in the manufacture of liquors, in brewing, and in medicine. In China it is used as a spice, and medicinally in cases of colic, constipation, and fever. The plant which produces this fruit has not yet been botanically identified, and it has as yet been found impossible to obtain living specimens. Inquiries have been made at all the principal ports of export and supposed places of production, but all such attempts have been hitherto without results, and the plant remains undetermined.

Cassia.—The various specimens exhibited of this bark have attracted much interest at Vienna, principally from the fact of the continental supply being derived almost exclusively from China. It is the bark of the cassia tree (*Cinnamonum aromaticum*), and is largely cultivated in the southern provinces of China. It is employed in medicine, but principally as a spice for household use, and in the manufacture of liquors and chocolate. The Chinese also use it as a condiment and in medicine, attributing to it excellent tonic and sedative properties. On the continent of Europe it is used in lieu of cinnamon, and needs perhaps little more than favourable introduction into the United Kingdom to find similar application. The production is practically unlimited, as the tree is planted on ground which is unsuited to other cultivation, and it requires no special care during the period of growth.

Tobacco.—The specimens of Chinese tobacco would be of little interest but for the fact that its low price is bringing it into the European market for adulterating better and more expensive qualities. Chinese tobacco has less strength and flavour than American, but it is doubtful whether this is not attributable to the defective methods of preparation rather than to inherent inferiority. It is cut into thin hair-like fibres, and is of colours varying from a deep dark brown to a brownish yellow. In appearance it resembles Hungarian tobacco, and its smoke bears the same musty and unpleasant odour. The Chinese smoke it in small pipes, or in cigarrettes rolled in bamboo paper, sold at the rate of eight for a penny. The market price of the tobacco is from 2*l.* to 4*l.* 10*s.* per picul of 133⅓ lbs.

Camphor.—The specimens of camphor and the various appliances employed in the manufacture, are of special interest and value, as illustrating a branch of commerce peculiarly Chinese, and of considerable importance to the western world. The camphor imported into Europe comes principally from the island of Formosa, and the producing districts lie in a narrow belt of debateable ground, separating the border Chinese settlements from the territory still occupied by the Aboriginees of the island.* The manufacture is attended with constant danger owing to the quarrelsome disposition of the savages and their jealousy of Chinese encroachments.

The camphor which is exhibited in small granular masses of white and yellowish colour, is obtained by distillation from small chips of the wood of the *Laurus camphora.* Mr. Taintor, a well qualified observer, thus describes the process "A long wooden trough, frequently hollowed from the trunk of "a tree, is fixed over a furnace, and protected by a coating of clay. Water "is poured into it, and a board perforated with numerous small holes is luted "over it. Over these holes the chips are placed, and covered with earthen- "ware pots. Heat being applied in the furnace, the steam passes through "the chips carrying with it the camphor, which condenses in the form of "minute white crystals in the upper part of the pots."† The camphor is sometimes adulterated with alum, powdered cuttlefish, and a peculiar mucilaginous substance obtained from the bark of a tree. It is stored in vats and tubs while awaiting exportation, and gives out a quantity (estimated at 3 to 4 per cent.) of uncrystallizable camphor in the shape of a yellowish oil, held nearly valueless in China, but deserving of examination, and capable, perhaps, of being profitably imported into England, and employed as a substitute for spirits of turpentine in the arts, as well as in medicinal purposes. The camphor tree is said to flourish throughout the dense forests which form the eastern districts of Formosa, and there appears to be little prospect at present of any exhaustion of the stores of supply. The method of production at present followed appears, however, to be most wasteful and unsatisfactory, and Mr. Taintor (who has made a careful study of the resources of Formosa, and written a most valuable and interesting report upon them) regrets that no measures are being taken to replace the trees destroyed, by planting young ones.

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* Mr. Commissioner Taintor, "Report on Tamsui, 1869," p. 165.
† Report on Tamsui, 1869.

In addition to the specimens of Formosan camphor exhibited, are samples of Malay camphor known as *Camphor-baroos*, and prized by the Chinese at a value inordinately high. This camphor is found in concrete masses, in fissures of the trees, and is the product of the *Dryobalanops Camphora*, a forest tree confined to the Malay peninsula, Borneo, Sumatra. The finest Chinese camphor is worth about 7*l.* per 133⅓ lbs., while *Camphor-baroos* costs nearly as much per single pound. Specimens have been analysed and it appears that the over-prized Malay camphor possesses in an inferior degree the qualities of the ordinary camphor obtained by distillation.

Indigo.—The specimens of Chinese indigo exhibited are well worth the attention of experts, and of those interested in the trade. It is produced in many parts of China, in widely differing latitudes, and under varying conditions of soil and cultivation. Indian indigo is of a finer quality and better colour, and even Manilla indigo is more highly esteemed in China, but there seems little doubt that improved methods of cultivation and manufacture would make Chinese indigo, especially that of Formosa, a formidable rival to the plant of Indian growth. That indigo is an original and indigenous product of China is proved by numerous allusions to it in the earliest Chinese literature, as the *Book of Odes*, and by the generally received tradition and record of its culture. The Chinese Herbal makes mention of one species formerly imported from Persia and used as medicine, but this is now superseded by an extractive from the indigo of ordinary use.

The Formosan indigo is said to receive little attention at the hands of the cultivators,* and it is reported also to vary much in quality, and to be adulterated largely with earth and refuse sugar. The method of preparation in China is extremely primitive and simple. The stems are cut down in autumn, thrown, leaves included, into large tanks filled with water, and suffered to remain there until decomposed. Lime is added to hasten the process, the water is beaten and stirred to a froth, and the colouring matter precipitates itself on the bottom of the tank. The water is drawn off, and the thick blue paste which remains as a deposit is packed in baskets for sale.

The specimens exhibited under the heading dried indigo are wrongly named, indigo here being the verbal translation of the Chinese name, which is applied to any blue vegetable dye. This dried indigo is, in fact, nothing but the native Prussian blue, said to be introduced into China some 30 years ago, when an intelligent Chinese sailor acquired its method of manufacture in London. Prussian blue was then an important item among the imports, but the native manufacture now renders the consumers independent of foreign supply. The Chinese mode of manufacture is as follows :—A buffalo hide is cut to pieces, put in a large earthenware jar, and boiled for several hours in a solution of sulphate of iron and potash; the decoction thus obtained is dried to a solid consistency, and made up into cakes. Canton supplies the whole of China with this dye, and the export coastwise is very considerable. It is used in the dyeing of all kinds of cotton cloth, and in the colouring of green teas. Its value is about 3*l.* per pecul of 133⅓ lbs.

Arts, Industries, and Manufactures.—The specimens grouped as articles of merchandise, imported, exported, and carried coastwise, represent with very remarkable completeness the commercial capabilities and requirements of the Chinese empire. The remaining groups illustrate the past history and present condition of the most important branches of Chinese art, industry, and manufacture. And it is here that the main interest of the Chinese collection concentres, and that its principal value is to be found. It appears to be generally admitted that the great utility and importance of International Exhibitions lies in the opportunities they afford of disseminating and diffusing sounder principles of art and higher standards of taste among the masses. In the collecting together under one roof the characteristic industries and arts of widely differing nationalities and civilizations, by bringing, *par exemple*, the English artisan face to face with the ingenious intricacies of Oriental producers, the higher fancies of the continental artificer, the gorgeous colouring and elaborate designs of Southern Europe, a spirit of emulation is roused, latent tastes are developed, new ideas germinate, and a general widening of the grooves of thought and imagination, a general elevation of the popular taste appear as the result.

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* Mr. Commissioner Man, "Report on Takao, 1868."

Even the least interested observer can scarce fail to be struck with the extraordinary improvement in the direction of taste which has characterized British glass, metal, porcelain, and kindred manufactures, since the day when the Prince Consort's Great Exhibition set the world astir, and gave an impetus to British art. It may be said that this is but one manifestation of the working of a general law of progress, of which the Exhibition itself was not a cause but a consequence. That such Exhibitions have, however, a most astonishing and permanent influence, is proved by the prevalence of forms and types known only through their medium, reproduced at first as mere copies, but gradually assimilated to a national standard, yielding and gaining in different directions, in accordance with existing uses and requirements. The introduction of types and designs hitherto unknown, is obviously a most important feature in such Exhibitions as the Austro-Hungarian one of 1873, and it is for this reason that the articles illustrating the arts and industries of China, hitherto but partially known at best, are likely to be of special interest and value to British exhibitors.

Porcelain.—The collection of porcelain is of considerable interest and importance in that it illustrates with fair completeness the history and decadence of the art in China. Some of the specimens in the collection of the venerable Archdeacon Gray, are of the best period of the manufacture and in the highest style of Chinese art. On comparison of the modern porcelain with veritable antiques, there can be no doubt that the art has greatly declined during the last century. The colours of the present day are neither so vivid nor so transparent as those of a hundred years ago; even the biscuit is inferior in whiteness and purity, and the glaze is rougher and often marred by grittiness. The word porcelain (Portuguese, *Porcellana*), was first applied by Europeans to the ware, from the resemblance of its fine polished surface to that of the shell so named, and from this point of view, the earlier specimens of the art are more deserving of the name than those manufactured for the modern market.

The collection of modern chinaware is large, and has the additional recommendation of being supplemented by a collection (made by H. Kopsch, Esq., Commissioner of Customs at Kiukiang) illustrating native processes and showing the materials, clay, quartz, steatine, glaze, and the colours employed. The whole of the modern ware is made at King-teh-Chên in the province of Kiangse, where potteries were first established about 900 years since, and where, prior to the Taiping rebellion, there were 270 to 290 furnaces and about 250,000 workmen. At the present time there are about 120 furnaces employing perhaps 150,000 men. The chinaware known in Europe as "Canton" is only painted at that port, the plain biscuit being prepared at King-teh-Chên, and sent to Canton to be painted by southern artists. In the painting of birds, insects, flowers, &c., the modern porcelain still retains a certain excellence, the accuracy and minuteness of detail and finish being often of extraordinary merit; but in splendour, variety and vividness of colouring, the ancient specimens are unapproachable. Some head-rests and fruit jars exhibited by Mr. Commissioner Kopsch, attracted the general attention of connoisseurs, and the style in which they were painted, chrysanthemums and peonies upon a diapered ground of half toned green and blue, was superior to anything else in the same collection. A sort of majolica ware, exhibited by Hu Tao-tai of Shanghai, consisting of gourd and melon-shaped vessels with stems and leaves of the plant turning round them *in rilievo* and with covers of widely differing colour, were also worth notice as being new to European art, and as possessing considerable intrinsic merit, though of a somewhat *bizarre* character.

The brown and blue earthenware, in which strange effects are produced by the application of a vitreous glaze to certain parts of the figures only, was also new to European art, and is well worth the attention of English potters. The principal seat of this manufacture is at Shek-wan near Canton, where large potteries have long existed for making cooking and household utensils; it is only during the last ten years that the ware has been shaped into figures, bowls, and articles for ornamental purposes. Among the novelties exhibited by the Royal Worcester Porcelain Works, was an application of a beautiful turquoise blue enamel to a surface of terra-cotta colour, and it is not without interest to observe that the Shek-wan earthenware consists principally of an exactly similar combination, though applied to coarser scenes and subjects, and with far inferior skill and artistic merit.

Enamels.—The Cloisonné enamels exhibited by Hu Tao-tai call for special notice, not only on account of their intrinsic merit and beauty, but because the art they represent is exclusively Chinese, and its secret was long vainly sought by European artists. The collection sent to Vienna is undoubtedly the largest and most complete ever seen in Europe, though the individual specimens are perhaps surpassed by jars and vases brought to Europe in early days, or taken at the sack of the Summer Palace. The general characteristics of this peculiar art are well known, and it is needless to point out its excellencies in colour, form, or design. The red and white Cloisonné are more rarely seen than the blue, and the specimens of these colours exhibited were the objects of much attention, The white enamel is more difficult to apply than the blue, and hence its cost is greater, and it is more rarely seen.

For some years the art was reported lost, and enormous prices were demanded by Chinese "curio" sellers, whenever a piece of enamel was brought into the market. There is no doubt that cloisonnés, like porcelain, attained their highest perfection some generations since, but it is also certain that the art of making cloisonné enamels is still practised in Peking, and that the productions of the present day are not so greatly inferior to those of the best periods of the art. The method of preparation is no longer a trade secret, but as it is little known in England, it may be well to give a short account of it here. The first process is to shape the vase or object it is intended to enamel out of a sheet of thin red copper. Upon this the design, flowers, animals, geometrical patterns, &c. are traced with a metal pencil, and upon this design a flat copper thread is overlaid, twisted, bent, and joined, so as to form the required pattern, and then soldered on to the vase by means of silver solder. Finely powdered enamel of various colours, melting at a comparatively low temperature, is made into a paste with mucilaginous water, and is then applied with a pencil to the spaces formed by the copper thread. When the vase is covered with this paste it is dried before a slow fire, then subjected to great heat, which causes the molten enamel to spread into and fill up the spaces in which it is placed according to the colours of the design. The yellow and white enamels shrink considerably when melted, and require to be enamelled a second and third time in order to fill the spaces. The process of firing is repeated after each application of the enamel, and the final operations consist in smoothing and polishing the surface of the vase, and in washing the edges of the designing thread with a mercurial amalgam. The process has been introduced into France with some success, but the art is too costly and laborious to become readily naturalised in Europe, and the French artists have now abandoned the attempts at any further competition with the Chinese.

Grass Cloth.—Among the most interesting of the textile fabrics exhibited, are the specimens of grass cloth woven from the fibres of different plants, some of which have been identified as *Urtica nivea*, *Sida tiliacfolia*, *Dolichos bulbosus*, &c. The first-named plant is common in China, and grows luxuriantly with little cultivation or attention. The stalk resembles that of the hemp plant, and its filaments, boiled in lime water, and exposed to the sun, become white and flexible, and suitable for weaving into cloth. When dried the raw fibres are divided by hand labour into threads, smoothed and twisted, tied together at the ends, and carefully wound. The winding and warping are done in the usual way, and the weaving in looms with the ordinary treadle. The woven cloth is bleached by subjecting it to a protracted boiling in water slightly alkalified with potash, and then scoured by the ordinary process of open air bleaching. Grass cloth is produced in many parts of China, and the specimens exhibited are from seven different provinces. The exportation to Europe is comparatively limited, possibly because it is better adapted for use in tropical than temperate latitudes, but its cost, as compared with linen, is in its favour. The specimens of fibre which accompany the cloth might perhaps be worked up by the aid of machinery in a more economical fashion into fabrics of a closer, stronger, and more durable character.

Matting.—The manufacture of matting is a most important branch of industry, and is well illustrated by specimens of the many varieties made, accompanied by a working model of the loom and samples of the various materials employed, collected and arranged with laudable public spirit by T. B. Cunningham, Esq., an American merchant of Canton.

The reeds are of several species, some growing in salt water flats and others only in inland marshes. They are gathered when well dried, and are not subjected to any bleaching process, but become white in due course, and before the application of any dye stuff. The colours employed are red, green, yellow, and blue, of which red is most extensively used. This colour is produced by an infusion of saffron wood cleared with alum, in which the reeds are soaked for three periods of six days each, being dried after each immersion. The process of dyeing blue is the same as red, with the addition of sulphate of iron to the infusion. Yellow is obtained by an infusion of the seeds of the *Sophora japonica* applied to the reeds in the same manner; and green by a decoction of the leaf and twigs of a local plant (*nat. ord. Acanthaceæ*) and sulphate of copper.

The loom for weaving matting is very simple, consisting of two uprights about five feet distant from each other, and connected by cross-bars about three feet apart. The warps (strings of native hemp) are fastened by one end to a piece of bamboo, passed through the weaving bar and round the two cross bars. A flat bamboo, two yards long, on which the reeds are fastened by a notch and thus drawn between the strings of the warp, answers for a shuttle, and the reeds are woven while damp and pliable. The woven matting is then dried, and, to remedy shrinking, it is stretched over a frame, and the irregular parts of the texture are pressed down by hand. The projecting ends of the warps are then trimmed to a uniform length and passed between the reeds of some other piece of the same pattern, thus joining the pieces and forming with 20 warps a roll of 40 yards in length.

The import into the United Kingdom is comparatively small, but it is increasing, and the cheapness, durability, and general utility of the manufacture, induce and justify a belief that the trade in this article is destined to a very considerable expansion.

Plumagery.—The employment of feathers in the making of ornamental headdresses is an art of some antiquity in China, and the materials and tools, both of which were exhibited with the result, are worth examination. The resemblance between the Aztec plumagery as found in Mexico at the time of the Conquest, and that produced in China, has been remarked, and the present contributions from China will enable definite comparisons to be instituted. The art is of considerable antiquity in China, and does not appear to have been introduced into Europe, though its applications could scarce fail to be appreciated in the world of millinery and fashion. The headdresses from Canton, though tasteful in design and gorgeous in execution, represent only two of many styles, varieties, and colours. The ornaments are of copper instead of silver filagree, and the combs and earrings are less elaborate than in many specimens. The feathers are of every tint and shade of blue and green, and pleasing effects are produced by alternating azure, ultra-marine, and sapphire blues, with emerald, chrome, and olive greens, laid upon a frame of filigree flowers and dragons interspersed with pearls. The art is not, perhaps, high in tone, but it is inexpensive, and has the merit of being new to Europe. The feathers employed are those of the Ternate Kingfisher (*Tanysiphera Dea*), a native of New Guinea and the Indian Archipelago, and found also in the Island of Hainan. The cost of the entire skin and plumage is about 8*d.* per piece.

Lacquered Ware.—The finest specimens of lacquered ware in the Chinese collection are those included in the museum of the Venerable Archdeacon Gray; but the best even of these, contrast unfavourably in finish, polish, and artistic design, with the magnificent specimens of Japanese art exhibited in the neighbouring court. Among the Japanese, however, the art appears to have passed its zenith, and the modern productions are not to be compared with veritable antiques, while in China lacquer ware is an improving and progressive art. True, an enormous quantity of roughly finished work is annually turned out to meet the increasing demand for cheap goods, but give a Canton manufacturer the two factors essential to creditable production, time and a fair price, and the result will probably stand comparison with the finest specimens of previous generations. The lightest kind of wood is always chosen for lacquering, and after the surface has been carefully planed and smoothed it is covered with a coat of grass cloth, and above this, with sheets of fine thin tenacious paper. A mixture of buffalo or pig gall with pulverised sandstone, serves as a priming, after which a coating of the lacquer is laid on with a brush, and the surface is allowed to dry in a dark room. These coatings are repeated from three to fifteen times, according to the fineness of the ware. When perfectly dry, the articles are painted and gilded. The gold colour is a solution of gold leaf in glue-water, and is laid on by means of lye of potash.

The Foochow lacquer is evidently of Japanese origin, and the art is a trade secret in the possession of a single family, by whom it is carefully and jealously guarded. The few specimens exhibited were much admired, and were certainly superior in point of design, colour, and finish, to any of the specimens exhibited from Canton.

The following TABLE shows the value of the Trade between China and Great Britain during the last Nine Years, comparing it with that of all other Countries massed together.

—	1864.	1865.	1866.	1867.	1868.	1869.	1870.	1871.	1872.
	£	£	£	£	£	£	£	£	£
Imports from Great Britain - -	3,883,586	4,123,262	5,224,432	6,276,670	8,159,614	9,240,386	8,985,370	9,717,416	9,728,623
Exports to " - -	12,109,185	12,335,293	11,399,083	11,122,595	14,013,612	11,723,934	10,687,823	13,269,565	14,340,704
Imports from other countries - -	15,646,666	17,612,607	20,419,166	17,602,360	16,279,960	16,249,266	15,399,546	17,087,500	16,293,341
Exports to " - -	5,892,981	7,682,866	7,387,852	8,175,901	9,024,700	10,657,333	9,975,533	11,684,000	13,599,233
Total trade with Great Britain -	15,992,771	16,458,555	16,623,515	17,399,265	22,173,226	20,964,320	19,673,193	22,986,981	24,069,327
Total trade with other countries -	21,539,647	25,295,473	27,807,018	25,778,261	25,304,660	26,906,599	25,375,079	28,771,500	29,892,574

It must be observed that in the trade with "other countries" are included the imports from and exports to Hongkong, of a great portion of which the origin or destination is Great Britain.

This TABLE shows the amount of British Shipping employed in the China Trade during the Years 1867–72, comparing it with the shipping of all other Nationalities.

—	1867.	1868.	1869.	1870.	1871.	1872.
Tonnage.						
British - - - -	3,711,080	3,332,092	3,052,320	3,125,590	3,330,881	3,954,130
Other countries - -	2,685,735	3,086,411	3,790,752	3,782,238	4,050,676	4,532,343
Total - -	6,396,815	6,418,503	6,843,072	6,907,828	7,381,557	8,486,473

The following TABLE shows the increasing share which Steamers take in the China Trade.

—	1866.	1868.	1870.	1872.
Tonnage of sailing ships entered and cleared at all the ports -	2,249,689	1,871,901	1,854,741	1,966,070
Tonnage of steamers entered and cleared at all the ports -	4,627,898	4,547,901	5,063,087	6,520,403

TEA TRADE.—Quantities of each description of Tea exported annually in Foreign Bottoms to each Foreign country from all Treaty Ports.

TEA.	1863.	1864.	1865.	1866.	1867.	1868.	1869.	1870.	1871.	1872.
BLACK:—	Peculs.	Peculs.	Peculs.	Peculs.	Peculs.	Peculs.	Peculs.	Peculs.	Peculs.	Peculs.
Great Britain	831,646	574,064	750,147	739,049	767,679	922,570	904,725	819,153	976,700	976,373
Hongkong	42,563	28,711	39,543	22,444	35,003	41,677	31,594	48,502	77,099	77,592
India	154	105	..	..	866	424	24	49	543	757
Singapore and Straits	2,935	1,565	8,712	2,770	4,373	832	1	454	2,170	1,615
Australia	63,427	65,484	72,846	65,666	97,956	114,559	81,970	83,194	91,991	107,624
New Zealand	..	..	1,164	2,600	4,525	4,157	4,371	1,262	5,553	5,215
South Africa	1,144	75	..	..	1,359	1,782	..	985	1,409	6,864
Canada	1,315	1,922	932	..	..	..	..	532	28	..
British Channel for orders	18,550	12,005	20,169	12,401	6,942	25,609	17,896	27,091	17,308	..
Continent of Europe	7,012	3,133	114	326	46	146	8,576	13	2,171	3,683
United States of America	83,964	74,731	65,767	84,959	107,003	59,149	127,639	77,089	147,030	151,998
Rio de Janeiro	..	..	..	426	..	1,622	..	..	..	221
Valparaiso	699	555	..	..	..	..	..	..	..	..
Peru	..	698	..	311	..	144	146	611	54	1,144
Buenos Ayres	848	997	2,970	..	2,704	1,622	2,572	1,940	825	2,325
Monte Video	..	..	..	..	..	1,073	..	..	..	..
Russia (Odessa)	..	..	..	..	..	..	..	..	14,880	35,125
„ and Siberia vi Kiakhta	2,729	1,518	4,326	10,705	8,835	13,251	39,529	21,161	16,818	37,980
Amoor Provinces	..	..	..	256	604	..	30	1	382	868
Japan	..	45	..	117	8	11	548	98	206	405
Philippine Islands	70	210	77	354	80	89	..	97	144	167
Cochin China	282	82	371	442	398	301	..	644	2,980	1,935
Siam	614	850	449	1,612	1,230	377	..	1,049	594	1,632
Java	485	1,921	4,498	2,625	3,248	3,724	..	3,196	3,751	6,401
Suez	..	..	..	..	..	..	10	..	..	246
Total	1,053,482	768,671	967,025	947,063	1,042,229	1,191,497	1,214,631	1,087,121	1,362,684	1,420,170

TEA TRADE.—Quantities of each description of Tea exported annually in Foreign Bottoms to each Foreign country from all Treaty Ports.—*cont.*

TEA.	1863.	1864.	1865.	1866.	1867.	1668.	1869.	1870.	1871.	1872.
GREEN:—	Peculs.	Peculs.	Peculs.	Peculs.	Peculs.	Peculs.	Peculs.	Peculs.	Peculs.	Peculs.
Great Britain	90,520	88,418	84,667	83,770	92,536	72,467	85,248	67,070	64,573	79,945
Hongkong	9,143	5,957	4,115	2,586	5,947	9,611	4,397	2,275	6,638	7,553
India	144	..	..	..	965	4,336	2,461	1,069	3,910	5,245
Singapore and Straits	..	..	..	..	..	..	..	..	2	..
Australia	3,244	745	39	118	176	274	30	127	28	65
New Zealand	..	..	..	..	..	..	..	..	11	11
South Africa	18	..	..	..	..	..	..	..	..	2
Canada	14,166	14,961	14,302	2,838	..	3,565	3,199	705	5,015	..
British Channel for orders	138	..	..	..	..	..	..	..	..	..
Continent of Europe	2,241	1,795	329	112	819	457	212	306	647	737
United States of America	73,881	63,351	111,440	100,191	122,716	129,148	136,071	155,594	151,519	162,454
Rio de Janeiro	..	204	..	126	..	..	..	..	..	337
Valparaiso	60	..	..	..	..	..	..	..	..	..
Peru	..	26	..	..	..	..	..	..	..	..
Buenos Ayres	217	330	370	..	275	131	303	253	225	105
Monte Video	..	..	418	54	..	..	..	..	..	..
Amoor Provinces	..	..	..	..	..	..	24	..	..	..
Japan	518	..	..	..	..	11	..	63	49	10
Total	194,340	175,752 ?	215,689	189,790	223,434	220,002	230,945	227,461	232,617	256,464
BRICK:—										
Great Britain	15,286	6,984	2,241	316	7	..	..	..	..	..
Hongkong	14,084	10,421	12,066	193	..	..	1,112	698	..	431
Russia and Siberia via Kiakhta*				17,995	65,096	53,123	72,359	62,194	83,403	94,927
Amoor Provinces	..	..	..	..	123	..	43	..	292	950
Japan	..	..	..	..	51	..	..	4	95	659
United States of America	..	..	..	..	..	..	..	..	..	27
Peru	..	..	..	..	..	..	7	..	..	..
Total	29,370	17,405	14,307	18,504	65,277	53,123	73,521	62,896	83,790	96,994

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* Besides the Brick Teas forwarded via Tientsin and Kiakhta to Siberia and Russia, considerable quantities are sent from Hankow and vicinity up the Han river to Fancheng, where overland carriage is resorted to. No figures are available for the years previous to 1871. During 1871 peculs 111,062·60 and during 1872 peculs 100,919·88 were thus forwarded to Siberia and Mongolia.

SILK TRADE.—Quantities of each description of Silk exported annually in Foreign Bottoms to Foreign Countries from all Treaty Ports.

SILK.	1863.	1864.	1865.	1866.	1867.	1868.	1869.	1870.	1871.	1872.
	Peculs.	Peculs.	Peculs.	Peculs.	Peculs.	Peculs.	Peculs.	Peculs.	Peculs.	Peculs.
RAW AND THROWN:—										
Great Britain - - -	2,989·09	8,325·74	26,682·44	20,047·11	22,606·14	29,885·55¼	22,492·73¼	22,310·17	28,562·89¼	30,578·32
Hongkong - - - -	26,316·27	14,238·06	8,759·18	8,875·17	9,418·88	11,343·06	13,119·16¾	16,118·52¼	16,807·23¾	18,612·93
India - - - - -	88	81·75	48·30	153·17	631·10	488·60	87·53	59·84	76·84	480·25
Continent of Europe (chiefly France).	..	1,968·53	5,553·41	2,754·89	5,162·98¼	8,504·92¾	6,520·29	5,692·79¾	7,634·12¼	3,621·61
Russia (Odessa) - -	..	..	..	..	..	..	..	..	..	12·80
United States of America - -	459·97	410·38	172·23	467·66	641·89	1,008·25	1,554·44	1,609·82	2,712·85	9,388·47
Japan - - -	..	2·40	24	24	..	1·18	1·62	..	1·45	3
Philippine Islands - - -	31·20	48·20	26·40	111·20	26·40	9·60	..	..	..	40·74
Suez - - - -	..	..	..	..	..	..	14·86	24·96	67·73	454·74
Total - - -	29,884·53	25,075·20	41,265·96	32,433·20	38,487·39¼	51,241·16	43,790·64	45,816·06	55,863·12¼	63,192·86
REFUSE:—										
Great Britain - - -	2,494·97	2,082·01	2,743·74	2,469·37	2,410·10	4,159·75	2,724·21	4,179·41	6,733·39¼	7,034·86
Hongkong - - - -	0·83	73·30	365·65	958·14	243·74	442·21	512·61	642·43	639·94	460·64
Continent of Europe (chiefly France).	..	32·96	68·69	339·16	3·65	129·15	50·26	58·57	28·17	161·73
United States of America - -	162·95	73·26	29·06	126·57	32·88	68·81	0·70	..	2·66	2·83
Total - - -	2,658·75	2,261·53	3,207·14	3,893·24	2,690·37	4,799·92	3,287·78	4,880·41	7,404·16¼	7,660·06
WILD RAW AND COARSE:—										
Great Britain - - -	53·15	46·02	96·53	21·39	16·61	5·12	87·75¼	278·22	517·36	1,039·26
Hongkong - - - -	3,870·12	3,413·53	4,940·50	5,681·18	5,257·43	6,535·68	4,650·26	3,010·40	3,015·59	1,888·73
India - - - - -	42	..	..	..	86	..	..	..	..	4
Continent of Europe (chiefly France).	..	..	29·59	..	..	..	34·37¾	54·97	38·86	10·06
United States of America - -	..	..	..	..	..	..	..	..	..	5·98
Japan - - - -	..	..	..	..	1·45	1·30	21·08	0·95	3·22	..
Total - - -	3,965·27	3,459·55	5,066·62	5,702·57	5,361·49	6,542·10	4,798·49	3,344·54	3,575·03	2,148·05

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